



How hand-eye coordination can improve balance



GUEST CORNER

LIZE LUBBE PT

A substantial portion of older adults are at high risk for falls, which cause fractures, hospitalizations, and reduce quality of life. Effective prevention strategies not only aim to strengthen older adults' physical capabilities but also enhance their sensory integration and functional coordination.

Balance is a critical component of overall physical health and injury prevention. Maintaining balance becomes increasingly challenging as we age or suffer from certain medical conditions. Natural changes occur with aging in the nervous system, muscle strength, and sensory processing. Research suggests that reaction times may become slower, proprioception (the body's sense of position) reduce, and visual acuity may gradually decline. Together, these shifts can adversely affect overall coordination and balance.

Physical therapy plays a vital role in improving balance, including designing strategies that improve hand-eye coordination and are closely intertwined with neuroplasticity.

UNDERSTANDING BALANCE

Balance refers to the ability to maintain the body's center of mass over its base of support. It involves a complex interplay between the sensory systems (visual, vestibular, and proprioceptive), musculoskeletal system, and central nervous system.

The Role of Hand-Eye Coordination
Sensory integration is the body's ability to combine inputs from the eyes (vision), inner ear (vestibular system), and joints (proprioception) to understand the body's position in space. Hand-eye coordination is the skill that allows an individual to synchronize visual input with hand movements. It is crucial for performing everyday tasks, such as reaching for objects, playing sports, or even walking without falling.

THE LINK BETWEEN HAND-EYE COORDINATION AND BALANCE

Functional coordination links strength and sensation to produce smooth, efficient movements during daily activities such as walking around obstacles, on uneven ground, or turning around. Improving hand-eye coordination can significantly enhance balance. Visual input helps the brain to better understand spatial awareness, body position and movement patterns, which in turn aids in maintaining stability. Increased coordination supports quicker and more accurate adjustments in posture and movement, reducing the risk of falls.

THE IMPORTANCE OF NEUROPLASTICITY

Neuroplasticity refers to the brain's

inherent capacity to adapt and change in response to experience, learning, and injury. It is the brain's ability to reorganize and form new connections, which underlies effective rehabilitation exercises and motor recovery. This process enables the brain to form alternative pathways. The human brain contains roughly 100 trillion synaptic connections that transmit information between neurons; remapping enables the brain to adapt by forming new pathways that help restore function.

Through consistent rehabilitation exercises, the brain strengthens existing neural pathways and forms new ones. Repeated activation reinforces these connections over time. Each attempt to perform a new movement, articulate a word, or complete a hand-eye exercise contributes to the development and strengthening of these essential neural networks.

THE ROLE OF PHYSICAL THERAPY IN IMPROVING BALANCE

A thorough assessment by a physical therapist is essential to identify your specific deficits in strength, flexibility, balance, and overall mobility. Physical therapists craft an individualized treatment plan based on your unique needs and goals.

1. *Strengthening exercises* to strengthen major muscle groups through resistance training to improve your overall stability and control.

2. *Hand-eye coordination drills* that mimic real-life scenarios (such as ball tossing, catching, and balancing objects) and aim to encourage the brain to adapt to new challenges and enhance coordination. As skills improve, complexity can be increased by introducing varying speeds, distances, and angles.

3. *Customized balance training* to develop stronger connections in the motor cortex, which leads to better control of your lower limbs. Exercises like standing on one leg, heel-to-toe walking, and use of balance boards build core stability that is essential to prevent falls.

4. *Cognitive training* that incorporates cognitive challenges into physical exercises to further stimulate neuroplasticity. Multi-task training, where you engage in physical and cognitive tasks simultaneously, can improve your coordination and reaction times.

5. *Repetitive practice*: Repetition is a key element in promoting neuroplasticity. Techniques such as task-oriented practice, where you repeatedly perform specific tasks, can help reinforce new neural connections related to your coordination and balance. The physical therapist will add a home exercise program to reinforce neural pathways to improve coordination and muscle control which, in turn, will enhance your rehabilitation progress.

SAMPLE EXERCISES TO BRING IT ALL TOGETHER

Stand bare foot on one leg, tossing a ball against a wall.

- The foot is firing through mechanoreceptor in your plantar fascia and big toe, communicating with the cerebellum (balance center of the brain).

- The major muscle groups in your leg, hip, core and pelvis work together to stabilize your body to keep you upright.
- Hand-eye coordination challenges the brain to multi-task with a rhythmic, repetitive activity that requires attention to skill, coordination, accuracy and repetition that will improve with practice as new neural pathways are established.

The above sample exercise may help you to improve walking on sand, turning your head to look around you, carrying a tray of filled glasses and being safe, balanced, coordinated, and in control of your body. Incorporating these exercises into a routine can significantly improve your functional capabilities, enhance recovery, and increase independence in daily activities.

If you need to enhance your stability, coordination, balance, and reduce the risk of falls, working with a physical therapist is a crucial first step toward achieving your goals and improve your physical performance.



Lize Lubbe is the owner of Lize Lubbe Physical Therapy with its main practice located at 190 Goldens Bridge Rd/Rt 22 in Katonah and a PT Studio in the premises of Apex Fitness (where her team focus on the rehabilitation of sports-related injuries). Learn more by calling 914-875-9430, emailing contact@lizeclubbept.com or visiting www.lizeclubbept.com.

We have moved. Note our new address at 190 Goldens Bridge Road, Route 22, Suite 5 (at the lower level), Katonah, NY 10536.

It is an easily accessible location with ample parking.



We are hands on PTs!

The professional services of the team at **Lize Lubbe Physical Therapy** provides a wide range of PT rehabilitation services to patients young & old, including:

- Pre & Post Surgery Rehabilitation
- Sports Injury Rehabilitation
- Neurological Rehabilitation
- Treatment of Musculoskeletal & Orthopedic Conditions
- Postural, Balance & Gait Training
- Pain & Headache Management
- Body Rebalancing Through Diaphragm Breathing & Pelvic Stability



190 Goldens Bridge Rd.
Suite 5, Katonah, NY 10536



914.875.9430



www.lizeclubbept.com



contact@lizeclubbept.com

