**Three Most Important Factors for Balance and Life Longevity**

Top 3 factors that have the most impact for Seniors and their quality of life, life longevity and their ability to avoid unintended falls. What are those factors that I have seen in the field to be the best indicators?

1. Leg strength
2. Vestibular system
3. Neuromuscular system

So, how does each system affect us?

Leg strength is considered a *life indicator*. It is essential to movement, mobility and independence. The *Vestibular system* is key and considered the most important factor to our balance.

**Leg Strength:**

Age-associated loss of muscle mass (sarcopenia) and strength (dynapenia)

Dynapenia (pronounced dahy-nuh-pē-nē-a, Greek translation for poverty of strength, power, or force) is the loss of muscular strength not caused by neurological or muscular disease

 is associated with a loss of independence that contributes to falls, fractures, and nursing home admissions, whereas regular physical activity has been suggested to offset these losses. The purpose of this study was to evaluate the effect of habitual endurance exercise on muscle mass and strength in active older adults. A longitudinal analysis of muscle strength (≈4.8 years apart) was performed on 59 men (age at start of study: 58.6 ± 7.3 years) and 35 women (56.9 ± 8.2 years) who used endurance running as their primary mode of exercise. There were no changes in fat-free mass although body fat increased minimally (1.0-1.5%). Training volume (km·wk, d·wk) decreased in both the men and women. There was a significant loss of both isometric knee extension (≈5% per year) and knee flexion (≈3.6% per year) strength in both the men and women. However, there was no significant change in either isokinetic concentric or eccentric torque of the knee extensors. Our data demonstrated a significant decline in isometric knee extensor and knee flexor strength although there were no changes in body mass in this group of very active older men and women. Our data support newer exercise guidelines for older Americans suggesting resistance training be an integral component of a fitness program and that running alone was not sufficient to prevent the loss in muscle strength (dynapenia) with aging.

It has been reported that nearly 40% of all nursing home admissions are in some way related to falls.

SOURCE: National Library of Medicine (<https://pubmed.ncbi.nlm.nih.gov/24263662/>)

**Vestibular System:**

Vertigo, Meniere’s disease can play a role in balance.

Explain the common nerves between the inner ear and the eyes.

What is vestibular balance disorder?

Dizziness and vertigo are symptoms of a vestibular balance disorder. Balance disorders can strike at any age, but are most common as you get older.

Your ear is a complex system of bone and cartilage. Within it is a network of canals. These are called semicircular canals. The canals are filled with fluid. The position of the fluid changes with movement. A sensor in the ear then sends the information to your brain to contribute to your sense of balance. These and other delicate pieces make up the vestibular system.

Certain things can affect the signals from any of the parts of the vestibular system causing symptoms.

*What causes vestibular balance disorders?*

Common causes of vestibular balance disorders include:

Medicines, Infections, Inner ear problems, such as poor circulation in the ear

Calcium debris in your semicircular canals

Problems rooted in your brain, such as traumatic brain injury

**What are the symptoms of vestibular balance disorders?**

**The symptoms of a vestibular balance disorder include:**

Dizziness

Feeling off-balance

Feeling as if you are floating or as if the world is spinning

Blurred vision

Disorientation

Falling or stumbling

*Less common symptoms include:*

Nausea

Diarrhea

Vomiting

Anxiety

Fear

Changes in your heart's rhythm

How is vestibular balance disorder diagnosed?

You may need to work with an ear, nose, and throat specialist (ENT, or otolaryngologist). Many conditions can cause dizziness and lightheadedness. Part of the diagnosis may involve ruling out other causes. After reviewing your medical history, your healthcare provider may do the following:

Hearing exam

Vision exam

Blood tests

Imaging tests of the head and brain

Clinical tests of balance

Look at your posture and movement, using a structured, exam called a posturography

How is vestibular balance disorder treated?

Treatment will depend on the cause of your balance disorder and may include:

Treating any underlying causes. Depending on the cause, you may need antibiotics or antifungal treatments. These can treat ear infections that are causing your balance disorder.

Changes in lifestyle. You may be able to ease some symptoms with changes in diet and activity. This includes quitting smoking or avoiding nicotine.

Epley maneuver (Canalith repositioning maneuvers). These are a specialized series of movements of your head and chest. The goal is to reposition particles in your semicircular canals into a position where they don’t trigger symptoms.

Surgery. When medicine and other therapies are unable to control your symptoms, you may need surgery. The procedure depends on the underlying cause of the disorder. The goal is to stabilize and repair inner ear function.

Rehabilitation. If you struggle with vestibular balance disorders, you may need vestibular rehabilitation or balance retraining therapy. This helps you move through your day safely. A rehabilitation specialist will help you learn how to cope with dizziness in your daily life. You may need to learn better safety strategies and make adjustments for

Going up and down stairs

Driving (ask your healthcare provider when it will be safe for you to drive)

Walking and exercising

Using the bathroom

Organizing your home to make it safer, such as tightening handrails

Changing your shoes or clothing, such as wearing low heeled shoe

Changing your daily habits, such as planning your day so that you won't be walking in the dark

Learning how to use a cane or walker

What are the complications of vestibular balance disorder?

Possible complications include:

Injury from falling

Reduced quality of life

Discomfort

Living with vestibular balance disorder

The symptoms of vestibular balance disorder can interfere with regular daily activities and your ability to drive, work, or enjoy recreation activities. This can cause symptoms of depression and frustration. Counseling can help you learn to cope with the disorder and life style impacts.

*When should I call my healthcare provider?*

Feeling lightheaded or dizzy occasionally happens to most people. If these sensations are frequent and affect your quality of life, contact your healthcare provider.

*Key points about vestibular balance disorders*

Vestibular balance disorders can affect orientation and balance.

Treatment depends on the underlying cause and can include medicine, rehabilitation, and lifestyle changes. You may need surgery for symptoms that do not resolve with other treatments.

Talk to your healthcare provider if you have symptoms of vertigo, dizziness, or hearing changes. These can mean you have a vestibular balance disorder.

***Next steps***

Tips to help you get the most from a visit to your healthcare provider:

Know the reason for your visit and what you want to happen.

Before your visit, write down questions you want answered.

Bring someone with you to help you ask questions and remember what your provider tells you.

At the visit, write down the name of a new diagnosis, and any new medicines, treatments, or tests. Also write down any new instructions your provider gives you.

Know why a new medicine or treatment is prescribed, and how it will help you. Also know what the side effects are.

Ask if your condition can be treated in other ways.

Know why a test or procedure is recommended and what the results could mean.

Know what to expect if you do not take the medicine or have the test or procedure.

If you have a follow-up appointment, write down the date, time, and purpose for that visit.

Know how you can contact your provider if you have questions.

SOURCE: John’s Hopkins Medicine (<https://www.hopkinsmedicine.org/health/conditions-and-diseases/vestibular-balance-disorder>)

**Neuromuscular system:**

The connection between the brain, spine and the muscular system. The connection between the brain, spine and the muscular system.