

dynamic balance exercises for seniors

The Importance of Dynamic Balance Exercises for Seniors

dynamic balance exercises for seniors are crucial for maintaining independence, preventing falls, and enhancing overall quality of life as we age. This article delves into the multifaceted benefits of incorporating dynamic balance training into a senior's fitness routine, explaining why it's more effective than static exercises alone. We will explore various types of dynamic balance exercises, from simple movements to more challenging activities, and discuss how to adapt them to individual fitness levels and any existing physical limitations. Understanding the principles behind effective balance training will empower seniors and their caregivers to build confidence and agility. Ultimately, this comprehensive guide aims to provide actionable insights for improving balance and reducing fall risks through targeted exercise.

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Understanding Dynamic Balance

Dynamic balance refers to the ability to maintain equilibrium while in motion. Unlike static balance, which involves holding a steady posture, dynamic balance is about staying upright and in control as your body moves through space. This skill is essential for everyday activities such as walking, turning, reaching for objects, climbing stairs, and even getting out of a chair. It involves a complex interplay of sensory information from the eyes, inner ear (vestibular system), and proprioceptors in the muscles and joints, all coordinated by the brain to make constant, subtle adjustments to posture and movement.

For seniors, the ability to execute dynamic balance exercises effectively directly impacts their independence and safety. As individuals age, natural physiological changes can affect balance systems. Muscle mass can decrease, reaction times may slow, and sensory input can become less acute. These changes can make everyday movements feel more precarious, increasing the risk of falls. Therefore, focusing on exercises that challenge and improve these systems in motion is paramount.

Why Dynamic Balance is Crucial for Seniors

The importance of robust dynamic balance for seniors cannot be overstated. Falls are a leading cause of injury among older adults, often leading to serious consequences such as fractures, head injuries, and long-term disability. Poor dynamic balance is a primary contributing factor to these falls. When seniors struggle to adjust their bodies quickly and efficiently during movement, they are more likely to lose their footing when encountering uneven surfaces, unexpected obstacles, or even just during normal walking and turning.

Beyond fall prevention, good dynamic balance contributes significantly to a senior's overall functional independence. The ability to move confidently and without fear of falling allows individuals to continue engaging in activities they enjoy, such as gardening, shopping, or socializing. It fosters a sense of self-reliance and reduces the need for assistance, thereby preserving dignity and autonomy. Furthermore, many dynamic balance exercises also inherently improve strength, flexibility, and coordination, further supporting an active and healthy lifestyle.

Benefits of Dynamic Balance Exercises

The advantages of regularly performing dynamic balance exercises for seniors are wide-ranging and profoundly impact their physical and mental well-being. These exercises go beyond simply preventing falls; they enhance a senior's ability to navigate their environment with greater ease and confidence.

One of the most significant benefits is the direct reduction in the risk of falls and related injuries. By challenging the body's ability to adapt to movement, these exercises train the neuromuscular system to react more effectively to destabilizing forces. This improved responsiveness can mean the difference between a minor stumble and a serious fall.

Improved mobility and agility are also key outcomes. Seniors who engage in dynamic balance training often find that their gait becomes steadier, their ability to turn and change direction improves, and they feel more secure when walking on different terrains. This can translate into a greater willingness to participate in outdoor activities and community events.

Furthermore, these exercises often incorporate elements of strength training, particularly for the lower body and core. Stronger muscles provide a more stable foundation for balance, and a strong core is vital for maintaining an upright posture and controlling movements. The combination of strength and balance training leads to a more resilient and capable physique.

Cognitive benefits are also observed. Dynamic balance exercises require significant brain engagement, as the brain must process sensory information and send rapid signals to the muscles. This mental stimulation can help maintain cognitive function and improve reaction times. Finally, the increased confidence that comes with improved balance can lead to a better overall mood and a greater sense of well-being, encouraging seniors to remain active and engaged in life.

Getting Started Safely

Embarking on a new exercise program, especially one focused on balance, requires a careful and considered approach to ensure safety. Before beginning any new dynamic balance exercises, it is highly recommended that seniors consult with their physician or a qualified physical therapist. This is particularly important for individuals with pre-existing medical conditions, such as heart disease, diabetes, osteoporosis, or neurological disorders, as these can impact balance and the ability to exercise safely.

Choosing a safe environment is paramount. Exercises should ideally be performed in a well-lit area with no tripping hazards. Having a sturdy chair or countertop nearby for support is essential, especially when first learning new movements. It's also advisable to wear comfortable, supportive footwear that provides good traction. Avoid exercising on slippery surfaces or while wearing socks or slippers that can slide easily.

Starting slowly and gradually increasing the intensity and duration of exercises is key. Don't push too hard too soon. Listen to your body and rest when needed. Pain is a signal that something is wrong, and exercises should never cause pain. Focus on proper form over speed or quantity. Correct execution ensures that the intended muscles are engaged and reduces the risk of injury.

It is also beneficial to have someone present, especially during the initial stages of learning. A caregiver or friend can provide encouragement and assistance if needed, offering a helping hand to maintain stability. As confidence grows and proficiency improves, the need for constant supervision may decrease, but always maintaining a sense of caution is advised.

Types of Dynamic Balance Exercises

Dynamic balance exercises are designed to challenge the body while it is in motion, requiring constant adjustments to maintain stability. These movements mimic real-life activities and are highly effective for improving seniors' ability to move safely and confidently.

Walking Variations

Simple walking can be transformed into an effective dynamic balance exercise through various modifications. These variations challenge gait, coordination, and the ability to adapt to different stride patterns.

- **Heel-to-Toe Walking:** This exercise, also known as tandem walking, involves placing the heel of one foot directly in front of the toes of the other foot with each step, as if walking on a tightrope. It significantly challenges stability and requires precise foot placement.
- **Walking Backwards:** Walking in reverse forces the body to rely more on proprioception and controlled stepping, improving spatial awareness and balance. Ensure a clear path and start

with short distances.

- **Walking Sideways (Lateral Walks):** Stepping to the side engages different muscle groups and challenges balance in a lateral plane. Keep movements controlled and the feet slightly apart.
- **Walking with High Knees:** Lifting the knees higher during walking requires greater core engagement and a more deliberate lifting and placing of the feet, enhancing balance control.
- **Walking with Arm Swings:** Purposefully swinging the arms in coordination with leg movements helps to improve rhythmic balance and reinforces the mind-body connection.

Leg Strengthening Exercises

Strong leg muscles are the foundation of good balance. These exercises build the strength needed to support the body and react quickly to potential stumbles.

- **Single Leg Stance with Support:** While holding onto a stable surface, lift one foot slightly off the ground. Aim to hold for increasing durations. This directly targets the muscles responsible for ankle and leg stability.
- **Calf Raises:** Standing with feet hip-width apart, slowly rise onto the balls of your feet, then lower back down. This strengthens the calf muscles, crucial for pushing off during walking and maintaining balance.
- **Sit-to-Stand:** This fundamental functional movement builds quadriceps and glute strength. Practice standing up from a chair without using your hands as much as possible, and then slowly sitting back down.
- **Leg Extensions (Seated or Standing):** Strengthening the quadriceps is vital. Seated leg extensions can be done with or without light weights. Standing leg extensions involve straightening the leg forward, to the side, or backward while holding for support.

Core Stability Movements

A strong core is essential for maintaining an upright posture and providing a stable base for all movements. Core exercises improve the body's ability to control shifts in weight.

- **Pelvic Tilts:** Lying on your back with knees bent, gently flatten your lower back against the floor by tightening your abdominal muscles and tilting your pelvis upwards. This activates deep abdominal muscles.

- **Bird-Dog:** Starting on your hands and knees, simultaneously extend one arm forward and the opposite leg backward, keeping your core engaged and back straight. This promotes core stability and balance.
- **Bridges:** Lie on your back with knees bent and feet flat on the floor. Lift your hips off the floor, squeezing your glutes and engaging your core. Hold briefly, then lower slowly.

Coordination Drills

Coordination drills enhance the brain's ability to communicate with the body, improving the precision and timing of movements necessary for dynamic balance.

- **Toe Taps:** Stand and alternately tap the toes of each foot forward, to the side, and backward. Focus on controlled movements and maintaining balance.
- **Heel Taps:** Similar to toe taps, but focus on tapping the heel of each foot forward, to the side, and backward.
- **Alphabet Drawing:** While standing on one leg (with support if needed), "draw" the letters of the alphabet in the air with your lifted foot. This requires significant control and coordination.

Functional Movement Patterns

These exercises mimic everyday activities, making the training directly applicable to real-life situations.

- **Reaching Exercises:** While standing, practice reaching for objects at different heights and distances, requiring core engagement and weight shifts.
- **Turning Exercises:** Practice controlled turning in place, starting with small turns and gradually increasing the range.
- **Stair Climbing Practice:** If safe, practice ascending and descending stairs, focusing on proper foot placement and maintaining balance. Use handrails for support.

Progression and Adaptation

As seniors become more proficient with their dynamic balance exercises, it's crucial to gradually progress the challenge to continue seeing improvements. Progression can be achieved in several ways, and adaptations are key to ensuring exercises remain safe and effective for individual needs.

One primary method of progression is increasing the duration or repetitions of an exercise. For instance, holding a single-leg stance for longer periods or performing more repetitions of calf raises. Another effective strategy is reducing the base of support; for example, moving from standing with feet hip-width apart to standing with feet closer together, or eventually to standing on one leg.

Introducing unstable surfaces, with caution, can also significantly challenge balance. This could involve standing on a folded towel or a thick mat. Dynamic elements can be added, such as incorporating arm movements or head turns while performing an exercise, which further demands the body's compensatory mechanisms.

Adaptation is equally important. If an exercise is too difficult, modifications can make it accessible. For example, if a single-leg stance is challenging, seniors can start by simply lifting the heel of one foot slightly, or by holding onto a sturdy chair or wall for maximum support. As strength and balance improve, they can gradually reduce their reliance on external support. Conversely, if an exercise becomes too easy, it might be time to introduce a more challenging variation or a new exercise altogether.

The goal is to consistently challenge the balance system without overwhelming it. This thoughtful progression and adaptation ensures that dynamic balance exercises remain a beneficial and safe component of a senior's fitness routine, fostering continuous improvement and confidence.

Incorporating Dynamic Balance into Daily Life

The most effective way to improve and maintain dynamic balance is to integrate balance-challenging activities into everyday routines. This makes balance training a natural and sustainable part of a senior's lifestyle, rather than a separate, time-consuming activity.

Simple everyday actions can be consciously modified to enhance balance. For example, when walking around the house, seniors can practice walking with a slightly narrower stance, or take a few steps backward after walking forward. When reaching for items in a cupboard, they can practice shifting their weight carefully from one foot to the other. Even while waiting for a kettle to boil or for a microwave to finish, practicing a gentle single-leg stand for a few seconds can be beneficial.

Consider incorporating short bursts of balance practice throughout the day. Instead of one long exercise session, breaking it down into multiple shorter sessions can be more manageable and effective. For instance, doing calf raises while brushing teeth or a few heel-to-toe steps before sitting down to read can make a difference.

When going for walks, choosing routes with varied surfaces (where safe and appropriate) can provide natural balance challenges. Sidewalks with slight inclines or gentle slopes can help improve adaptability. Parking a little further away from store entrances can provide opportunities for more walking and navigating different ground textures.

Engaging in hobbies that naturally promote balance can also be highly beneficial. Activities like dancing, tai chi, or even gardening (with proper precautions) involve a significant amount of dynamic movement and weight shifting. The key is to be mindful and deliberate about these movements, rather than simply going through the motions.

By consistently looking for opportunities to challenge and improve balance in familiar settings, seniors can significantly enhance their stability and confidence in their ability to navigate the world around them. This proactive approach to integrating balance practice into daily life is a powerful strategy for long-term well-being and independence.

When to Seek Professional Guidance

While many dynamic balance exercises can be performed independently, there are specific situations where seeking professional guidance is highly recommended. Recognizing when to consult with experts ensures the safest and most effective approach to improving balance.

A primary indicator for seeking professional help is a history of frequent falls or near-falls. If a senior is experiencing a significant number of falls, it suggests an underlying balance issue that requires thorough assessment by a healthcare professional, such as a physical therapist or a geriatrician. They can identify the root causes, which might include neurological conditions, vision problems, medication side effects, or musculoskeletal issues.

Individuals experiencing dizziness, vertigo, or persistent unsteadiness should also seek medical advice. These symptoms can be indicative of vestibular disorders or other inner ear problems that directly affect balance and require specialized diagnosis and treatment plans. Attempting balance exercises without addressing these underlying issues could be counterproductive or even dangerous.

Seniors with chronic health conditions that can impact mobility and balance, such as Parkinson's disease, stroke, multiple sclerosis, severe arthritis, or diabetes with neuropathy, will benefit greatly from a personalized exercise program developed by a physical therapist. These professionals can tailor exercises to the specific limitations and needs of the individual, ensuring safety and maximizing effectiveness.

Furthermore, if a senior feels particularly anxious or fearful about falling, working with a qualified instructor or therapist can build confidence and provide the necessary support and guidance to overcome these anxieties. A professional can introduce exercises gradually and provide reassurance, empowering the senior to take on new challenges.

Finally, for anyone starting a new fitness program, especially one focused on balance, consulting a physical therapist or a certified fitness professional with experience in senior fitness is a wise first step. They can conduct a comprehensive assessment, teach proper exercise technique, and develop a safe and effective program tailored to the individual's capabilities and goals.

Q: What is the difference between static and dynamic balance exercises?

A: Static balance exercises involve holding a steady position, such as standing on one leg without moving. Dynamic balance exercises, on the other hand, focus on maintaining equilibrium while the body is in motion, like walking, turning, or reaching for objects. Dynamic balance is more crucial for everyday activities as it mimics real-life movements.

Q: How often should seniors perform dynamic balance exercises?

A: For optimal results, seniors should aim to incorporate dynamic balance exercises into their routine at least 3-5 times per week. It's also beneficial to integrate small balance challenges into daily activities as often as possible. Consistency is key for building and maintaining balance.

Q: Can dynamic balance exercises help with general mobility and walking?

A: Absolutely. Dynamic balance exercises directly improve a senior's ability to walk more steadily, turn with greater control, and navigate uneven surfaces. By strengthening the muscles involved in movement and improving coordination, these exercises enhance overall mobility and reduce the effort required for walking.

Q: What are the most important muscles to strengthen for dynamic balance in seniors?

A: The most important muscle groups for dynamic balance include the core muscles (abdomen and lower back), the muscles in the legs (quadriceps, hamstrings, calves), and the muscles around the ankles and feet. These muscles provide stability, support, and the ability to make quick adjustments.

Q: Is it safe for seniors with osteoporosis to do dynamic balance exercises?

A: Yes, it can be safe and even beneficial for seniors with osteoporosis to perform dynamic balance exercises, but with extreme caution and professional guidance. Exercises that involve gentle weight-bearing and controlled movements can help strengthen bones. It's crucial to avoid any jarring movements or sudden twists. Consulting a doctor or physical therapist before starting is essential to tailor a safe program.

Q: How can dynamic balance exercises help prevent falls in older adults?

A: Dynamic balance exercises train the body to react and adapt quickly to unexpected shifts in weight or changes in surface. This improved neuromuscular control means seniors are better

equipped to correct themselves if they stumble or lose their footing, significantly reducing the likelihood of falls and the severe injuries that can result.

Q: What if a senior is very weak or has significant balance issues? How should they start?

A: For seniors with significant weakness or severe balance issues, starting with very simple exercises close to a support system is key. This might involve sitting exercises to activate core muscles, or standing exercises while holding firmly onto a stable chair or counter. A physical therapist can provide a structured starting plan and progress them safely.

Q: Can dynamic balance exercises improve cognitive function?

A: Yes, dynamic balance exercises require significant concentration and coordination between the brain and the body. This mental engagement can help improve cognitive functions such as attention, reaction time, and spatial awareness, offering a dual benefit for seniors.

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dynamic balance exercises for seniors: Client-Centered Exercise Prescription John C. Griffin,

2015-01-21 Client-Centered Exercise Prescription, Third Edition With Web Resource, emphasizes a personalized approach to exercise in which unique programs meet the interests and needs of individual clients. This resource will help you to prescribe exercise and guide clients in adopting, enjoying, and maintaining active lifestyles. Client-Centered Exercise Prescription, Third Edition, expands the role of the fitness professional from simple exercise prescription to include activity counseling, design modification, exercise demonstration, functionally integrated exercise, injury prevention, and follow-up monitoring for a variety of clients. Central to the book are seven client-centered models for each major fitness component that serve as a template of options for each decision in the prescription process: activity counseling, musculoskeletal exercise design, exercise demonstration, cardiovascular exercise prescription, resistance training prescription, muscle balance and flexibility prescription, and weight management prescription. The text explains the vital role that functionally integrated exercise plays in improving performance and maintaining musculoskeletal health and teaches how to recognize muscle imbalance and prevent complications. Fitness professionals will learn to make informed, client-centered decisions and address the following issues:

- Establishing rapport and increasing adherence by prescribing exercise programs that match clients' desires, needs, and lifestyles
- Understanding clients' unique psychological needs and using that information to keep them motivated
- Monitoring clients' needs both as they are originally presented and as they evolve over time
- Applying strategies for treating and preventing overuse injuries so that clients avoid injury and frustration, thereby avoiding withdrawal from the program
- Addressing the unique considerations of aging clients, including musculoskeletal conditions and functional mobility

The third edition of Client-Centered Exercise Prescription retains the client-centered approach of previous editions, offering simulated initial interviews with clients, teaching cues for demonstration, sample sessions, and sample counseling dialogue. The text also features numerous updates:

- More than 40 reproducible forms included in the text and duplicated in printable format in the web resource that can be shared with clients
- Applied exercise prescription worksheets that facilitate the flow from the prescription models to the prescription card
- Three new chapters on exercise prescription for aging adults that offer specific exercise recommendations for this growing demographic
- Expanded sections on applied nutrition, reliable field tests, safety and referrals, and a unique biomechanical approach to exercise modifications and functional progressions
- Five new case studies and other updated case studies that allow you to grasp how the material may be used in practice
- Theory to Application sidebars, numerous photos, and chapter summaries that will engage you and help you find the most relevant information

Using reliable field tests, practical nutrition guidelines, and applied exercise physiology concepts, this text will help both professionals and students better serve their current and future clients. Candidates preparing for certification exams, including the Canadian Society for Exercise Physiology Certified Personal Trainer (CSEP-CPT) exam, will find comprehensive treatment of the theory and applications covering the competencies required before entering the field. Practical examples, applied models, and scientific knowledge also make the text accessible to undergraduate students in fitness, exercise science, and health promotion programs.

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today there exist more than one million different products available on the world market. Despite the fact that the rising cost of health care, partly resulting from the new emerging technological applications, forms the most serious and urgent problem for many governments today, another important concern is that of patient safety and user protection, issues that should never be compromised and expelled from the Biomedical Engineering research practice agenda.

dynamic balance exercises for seniors: Therapeutic Exercise for Musculoskeletal Injuries
Peggy A. Houglum, 2018-10-30 *Therapeutic Exercise for Musculoskeletal Injuries, Fourth Edition With Online Video*, presents foundational information that instills a thorough understanding of rehabilitative techniques. Updated with the latest in contemporary science and peer-reviewed data, this edition prepares upper-undergraduate and graduate students for everyday practice while serving as a referential cornerstone for experienced rehabilitation clinicians. The text details what is happening in the body, why certain techniques are advantageous, and when certain treatments should be used across rehabilitative time lines. Accompanying online video demonstrates some of the more difficult or unique techniques and can be used in the classroom or in everyday practice. The content featured in *Therapeutic Exercise for Musculoskeletal Injuries* aligns with the Board of Certification's (BOC) accreditation standards and prepares students for the BOC Athletic Trainers' exam. Author and respected clinician Peggy A. Houglum incorporates more than 40 years of experience in the field to offer evidence-based perspectives, updated theories, and real-world applications. The fourth edition of *Therapeutic Exercise for Musculoskeletal Injuries* has been streamlined and restructured for a cleaner presentation of content and easier navigation. Additional updates to this edition include the following:

- An emphasis on evidence-based practice encourages the use of current scientific research in treating specific injuries.
- Full-color content with updated art provides students with a clearer understanding of complex anatomical and physiological concepts.
- 40 video clips highlight therapeutic techniques to enhance comprehension of difficult or unique concepts.
- Clinical tips illustrate key points in each chapter to reinforce knowledge retention and allow for quick reference.

The unparalleled information throughout *Therapeutic Exercise for Musculoskeletal Injuries, Fourth Edition*, has been thoroughly updated to reflect contemporary science and the latest research. Part I includes basic concepts to help readers identify and understand common health questions in examination, assessment, mechanics, rehabilitation, and healing. Part II explores exercise parameters and techniques, including range of motion and flexibility, proprioception, muscle strength and endurance, plyometrics, and development. Part III outlines general therapeutic exercise applications such as posture, ambulation, manual therapy, therapeutic exercise equipment, and body considerations. Part IV synthesizes the information from the previous segments and describes how to create a rehabilitation program, highlighting special considerations and applications for specific body regions. Featuring more than 830 color photos and more than 330 illustrations, the text clarifies complicated concepts for future and practicing rehabilitation clinicians. Case studies throughout part IV emphasize practical applications and scenarios to give context to challenging concepts. Most chapters also contain Evidence in Rehabilitation sidebars that focus on current peer-reviewed research in the field and include applied uses for evidence-based practice. Additional learning aids have been updated to help readers absorb and apply new content; these include chapter objectives, lab activities, key points, key terms, critical thinking questions, and references. Instructor ancillaries, including a presentation package plus image bank, instructor guide, and test package, will be accessible online. *Therapeutic Exercise for Musculoskeletal Injuries, Fourth Edition*, equips readers with comprehensive material to prepare for and support real-world applications and clinical practice. Readers will know what to expect when treating clients, how to apply evidence-based knowledge, and how to develop custom individual programs.

dynamic balance exercises for seniors: *New approaches for central nervous system rehabilitation* Pawel Kiper, Agnieszka Guzik, Maurizio Petrarca, Angel Oliva-Pascual-Vaca, Carlos Luque-Moreno, 2024-02-09 *Neurorehabilitation* is a complex and growing field of motor rehabilitation. It is specifically directed to apply restorative techniques to stimulate neural plasticity

of the central nervous system (CNS). Considering that neuroplasticity is maintained for the whole human life and can be stimulated through specific learning or exposure to enriched environments, we can hypothesize that applying specific treatments can be beneficial for people with CNS injury. Because the plateau of neuroplasticity can be observed after about 12 weeks from stroke onset it is vital to capitalize on this high level of brain reorganization by providing well-timed and well-designed treatments. Here we can distinguish a wide range of approaches developed for CNS recovery in acute, subacute, or chronic stage of injury. These approaches comprise priming or augmentation techniques, including innovative technologies like end-effector robots, exoskeletons, or virtual reality. Many of them have been confirmed as effective, but so far in clinical practice, we can still experience a lack of specific indications i.e., which therapy for how long time and for which patient's impairment can be applied.

dynamic balance exercises for seniors: Principles of Therapeutic Exercise for the Physical Therapist Assistant Jacqueline Kopack, Karen Cascardi, 2024-06-01 Principles of Therapeutic Exercise for the Physical Therapist Assistant is a textbook that provides PTA educators, students, and practicing clinicians with a guide to the application of therapeutic exercise across the continuum of care. Written by 2 seasoned clinicians with more than 40 years of combined PTA education experience, Principles of Therapeutic Exercise for the Physical Therapist Assistant focuses on developing the learner's ability to create effective therapeutic exercise programs, as well as to safely and appropriately monitor and progress the patient within the physical therapy plan of care. The content is written in a style conducive to a new learner developing comprehension, while still providing adequate depth as well as access to newer research. Included in Principles of Therapeutic Exercise for the Physical Therapist Assistant are: • Indications, contraindications, and red flags associated with various exercise interventions • Documentation tips • Easy-to-follow tables to aid in understanding comprehensive treatment guidelines across the phases of rehabilitation • Eye on the Research sections throughout the text dedicated to current research and evidence-based practices Also included with the text are online supplemental materials for faculty use in the classroom, consisting of PowerPoint slides and an Instructor's Manual (complete with review questions and quizzes). Created specifically to meet the educational needs of PTA students, faculty, and clinicians, Principles of Therapeutic Exercise for the Physical Therapist Assistant is an exceptional, up-to-date guidebook that encompasses the principles of therapeutic science across the entire continuum of care.

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dynamic balance exercises for seniors: Locomotion and Posture in Older Adults Fabio Augusto Barbieri, Rodrigo Vitória, 2017-02-07 This book is an attempt to advance the discussion and improve our understanding about the effects of aging and movement disorders on motor control during walking and postural tasks. Despite these activities are performed daily, there is a high requirement of motor and neural systems in order to perform both tasks efficiently. Both walking and posture require a complex interaction of musculoskeletal and neural systems. However, the mechanisms used to control these tasks, as well as how they are planned and coordinated, are still a question of discussion among health professionals and researchers. In addition, this discussion is more interesting when the effects of aging are included in the context of locomotion and the postural control. The number of older individuals is 841 million in 2015, which is four times higher than the 202 million that lived in 1950. Aging causes many motor, sensorial and neural deficits, which impair locomotion and postural control in the elderly. The severity of this framework is worsened when the aging goes along with a movement disorder, such as Parkinson disease, Chorea, Dystonia, Huntington disease, etc. Therefore, the aim of this book is to highlight the influence of different aspects on planning, controlling and performing locomotion and posture tasks. In attempting to

improve current knowledge in this field, invited authors present and discuss how environmental, sensorial, motor, cognitive and individual aspects influence the planning and performance of locomotor and postural activities. The major thrust of the book is to address the mechanisms involved in controlling and planning motor action in neurological healthy individuals, as well as in those who suffer from movement disorders or face the effects of aging, indicating the aspects that impair locomotion and postural control. In addition, new technologies, tools and interventions designed to manage the effects of aging and movement disorders are presented in the book.

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