SIRIPOS
Società Scientifica Italiana
di Riabilitazione e Posturologia dello Sport

Ita.J.Sports.Reh.Po.

Italian Journal of
Sports Rehabilitation and Posturology

SSN 2385-1988 [online] IBSN 007-111-19-55

2 -2015

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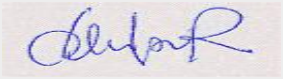
As Editor-In-Chief I want to welcome you to the Journal of Italian Journal of Sports Rehabilitation and Posturology In the last few years Rehabilitation and Traumatology Science applied to sports has passed gradually from empirical theories in the treatment and recovery of injured athletes to a significant enhancement of therapeutic strategies – thanks also to scientific contributions coming from all over the world. So a different approach to traumatology and rehabilitation as regards sports injuries has become possible t hanks to the contribution of: a) a better understanding of the healing process of injuries and surgery techniques b) a more adequate understanding of the clinical biomechanical behavior c) postural strategies along with the studies and analysis of the gestural movement d) the different myo-osteoarticular structures in response to internal and external load.
At present, most of the research highlights how important it is to treat injured athletes and to propose strategies and concepts based on an ' evidence-based approach'. So in a conceptual view of the rehabilitation of the injured athlete the therapist must choose those means and those strategies that reveal a clinic appropriateness, based on scientific data and aiming at an optimal return to sport.
The acquisition of new technologies for collecting clinical , physiological and rehabilitation parameters has allowed experts to improve their therapeutic abilities. The multidisciplinary treatment, now widely recognized by the scientific population , finds practical application difficulties because of the limited availability of rehabilitation specialists
Our editorial goal is to provide a tool for an adequate scientific update in the rehabilitation and sports posturology and to offer a modern, multidisciplinary point of view on traumatic injuries .

Kind Regards,



Rosario D'Onofrio,
Editor In Chief - Ita. J. of Sports Reh. Po.

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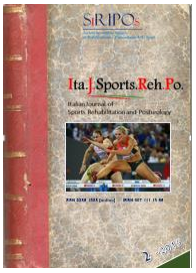

Giandonato J. Policastro C.D.
Senior Strength: Programmatic Considerations
for Aged Populations - Ita J Sports Reh Po 2 ; 2 ; 60 -74 : 2015 ;
ISSN 2385-1988 [online] - IBSN 007-111-19-55

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Sports Rehabilitation and Posturology

Senior Strength: Programmatic Considerations for Aged Populations

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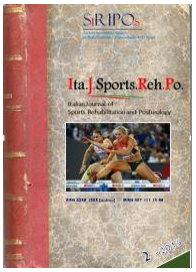
Abstract

As our planet ages, so do its inhabitants. According to a 2011 Population Reference Bureau report, population groups of those 65 and older are projected to account for 16 percent of the global population by 2050 (14). The number of those aged 65 and older is expected to eclipse the population of those four years and younger. The rapid growth in our global aged population is attributable to concomitant medicinal and technological advances arising in developed countries and an increase infant mortality rates throughout developing parts of the world. By 2030, nearly twenty percent of the US population will be 65 years or older (18). Many expect the already fractured US healthcare system to buckle once the remainder of the baby boomer generation turns 65. (Giandonato J. Policastro C.D. Senior Strength: Programmatic Considerations for Aged Populations - Ita J Sports Reh Po 2 ;2; 60 -74 :2015 ; ISSN 2385-1988 [online] - IBSN 007-111-19-55)



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Introduction

Our global economy relies on world's aging working population. As such, governmental organizations and businesses are staging multiple efforts to curtail rising healthcare premiums for aging employees and retirees. Organizations recognizing that their employees comprise their company's backbone and represent their greatest asset and financial liability are beginning to establish health promotion initiatives geared towards improving the health and welfare of their employees. Initiatives which include the creation and implementation of wellness programs are intended to improve the health status of employees in an effort to curtail rising health care premiums and disability (18). The medical community and health insurers have become increasingly involved in preventative and non-invasive care strategies for patients. As such, involvement in fitness programs is being advocated to patients.

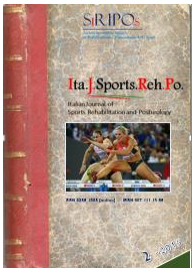
Aging is defined as the state of getting old and involves a host of complex physiological processes that are attributed to the accumulation of changes throughout the lifespan. The process of aging is influenced by lifestyle, heredity, and disease. Age is commonly associated with declines in physiological and neurocognitive functioning. There is an emerging need for strength and conditioning professionals to prescribe and manage exercise programs that meet the challenge of the aging population. This article will review peer-reviewed research regarding the importance of understanding the aging characteristics, components of fitness, assessing fitness, and implementing appropriate exercise programs.

Aging Characteristics

One of the most prominent changes occurring throughout the aging process is the reduction in cardiopulmonary functioning (16). A reduction in cardiopulmonary functioning is associated with a concomitant increase arterial stiffness and decrease of arterial compliance, which collectively reduce cardiac output. A decrease in myocardial elasticity is noted among older individuals (16), essentially nullifying the effect of the Frank-Starling mechanism, a process that permits greater venous return through elastic recoil of myocardial fibers which amplifies contractile force of the heart during systole. Drops in maximal heart rate, maximal stroke volume and consequential maximal cardiac output noted in aging persons is caused by a decrease in early left ventricular diastolic function (16). A reduction of VO2 max is noted throughout the lifespan, with a decline of 1% per year in healthy men and women after the age of 20 (16) and a decline of 10% per decade after age 30 (25). The decrease in aerobic power stems from declining maximal cardiac output and maximal arteriovenous oxygen difference. Age associated decrements are also observed in respiratory functioning. Strength of the respiratory musculature decreases with age, yet decreased chest wall compliance forces respiratory muscles to work harder thus adopting aberrant functioning patterns which create muscular imbalances and resultant postural issues. A decrease of lung elasticity is also observed in elderly populations (16), causing an increase in lung compliance which interferes with inspiratory and expiratory functions.

Musculoskeletal Health

A healthy musculoskeletal system is vital for an aging individual to have a good quality of life. Aging is associated with a degradation of the two components comprising lean body mass: bone and muscle tissue.



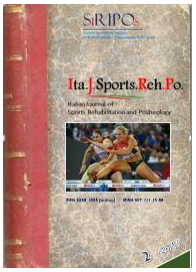
Diminishing hormonal activity throughout the life span impedes the bone remodeling process giving rise to osteoclastic activity which degrades bone tissue leading to reduced bone mineral density. Persons with reduced bone mineral density are more susceptible to fractures, which account for a significant number of disabilities and eventual deaths among elderly populations (2).
A decline in muscle mass, known as sarcopenia is also noted in aging persons owing to tapering outputs of testosterone and growth hormone throughout the aging process (3). Throughout the lifespan, inactive persons lose 20 to 40 percent of their muscle mass which is accompanied by a decrement in strength (16). Strength declines at a rate of up to 15% per decade in the fifth, sixth, and seventh decades and sharply erodes thereafter (4,24).
The simultaneous reduction of bone and muscle throughout the lifespan increases the likelihood of sustaining chronic and acute injuries and decreases functionality thus interfering with the execution of activities of daily living (2).

Neurocognitive Functioning

Aging is also characterized by degradation in neuroanatomical structures and consequently reduced neurocognitive capacity. Occurring in parallel with physiological changes, a cascade of neurocognitive alterations is evident throughout the aging process. Prominently, a reduction in cortical volume, specifically occurring in frontal, temporal, and hippocampal regions is marked by shrinkage of neurons, reduction of synaptic spines, and shortening of myelinated axons, is noted in aging brains (10).
The alteration of neuroanatomical structures throughout the aging process renders inhibitive effects on cognition, specifically, processing speed, executive functioning, and episodic memory (13). Research has indicated that exercise tempers cognitive decline during the aging process as it stimulates the transcription of brain growth factors, nerve growth factors, galanin, and neurotrophins, such as brain-derived neurotrophic factor (BDNF) (30). BDNF has been shown to improve neuronal plasticity, retard neuron cell death, induce neural regeneration and neuronal survival, and serves a reparatory role in brain trauma (30). The upregulation of BDNF has been purported to increase the brain's resistance to damage and neurodegeneration which accompany age (30).

Setting the Foundation

Optimizing respiratory functioning is vital to health and performance. Humans respire thousands of times throughout the day. At rest, respiratory rate averages 12 breaths per minute (1), equating to an average of 720 breaths per hour and 17280 breaths per day. Respiration involves the processes of inspiration, or inhalation, in which oxygen enters the body, and expiration, or exhalation, in which carbon dioxide is eliminated from the body. During inspiration, the sternocleidomastoid, scalenes, external intercostals, and diaphragm, which comprise the inspiratory muscles, expand the volume of the thoracic cavity. During exhalation, the rectus abdominus, external obliques, internal obliques, transversus abdominus, and internal intercostals, which comprise the expiratory muscles, contract to expel air out of the lungs. Altered respiratory functioning coupled with poor posture contributes to the hypertonicity of inspiratory muscles, thus igniting a series of muscular imbalances which may yield residual effects on the execution of activities.



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Breathing During Exercise

During physical activity, respiratory rate reaches nearly 50 breaths per minute (1). Proper breathing practices must be introduced to patients and/or clients and regulated during exercise. Proper breathing permits our body to take in more oxygen during activity while not overtaxing the muscles involved with inspiration.
During aerobic exercise, tempo breathing is beneficial (15). This includes a rhythmic breathing pattern that coincides with your gait. A breath of air in the nose and out the mouth every two steps allows oxygen to be delivered to working muscles. Tempo breathing helps ease the mind during exercise and prevents hyperventilation, provided there are no sudden increases in exercise intensity.
During anaerobic exercise, proper breathing is an integral part of core stabilization and posture. Diaphragmatic breathing, or belly breathing, helps engage core musculature, which protects the spine while regulating blood pressure during strength training. Another method, the Valsalva maneuver, is a forceful attempted exhalation against a closed airway (17). Employing this method is contraindicated for elderly populations and those diagnosed with or suspected of having cardiovascular disease as it significantly spikes systolic blood pressure. The inclusion of the Valsalva maneuver is not necessary for persons merely trying to improve their quality of life through exercise.

Muscle Tissue Care

The human body is composed of three types of muscle tissue: skeletal, smooth, and cardiac. Skeletal muscle tissue envelops the skeleton, pulling on bones to produce movement and in conjunction with bone, protects vital organs (21). As adults age, muscle tissue degenerates due to the lack of or decrease in physical activity. Muscle tissue is enveloped by fascia, a contiguous multilayered fibrocollagenous structure which links muscles together. Throughout the aging process these tissues lose their rigidity and pliability. Concordant fascial degeneration and declining muscle mass throughout the lifespan give rise to injuries and reduce functionality.
In order to stave off age associated declines in muscular function, a multipronged approach, encompassing self-massage, flexibility, and aerobic and anaerobic training, must be employed.

Self-Massage

Self-Myofacial Release (SMFR) is economical and time friendly modality utilized for preventative and restorative purposes and involves the use of foam rollers, balls, and sticks to apply pressure to tissues. SMFR is often utilized to improve extensibility of muscle tissue, correct muscular imbalances and to expedite the recovery process following exercise as it increases parasympathetic influence, redistributes cellular fluid, and promotes blood perfusion.

Flexibility

Stretching improves tissue length and compliance allowing individuals to achieve intended joint range of motion during activity.
Dynamic stretching involves actively moving through a range of motion.Prior to exercise, dynamic stretching prepares the body properly elevates the body's temperature and prepares it for the

exercise ahead. An example would be leg swings or arm circles. Static stretching involves gradually lengthening a muscle and holding for a period of time.
Static stretching is beneficial following exercise as it will reduce the heart rate and help restore muscles back to their original resting lengths. An example is bending over and touching your toes for 20 seconds.
Proprioceptive Neuromuscular Facilitation (PNF) stretching is used to enhance the passive and active range of motion of a muscle and involves a shortening contraction of the opposing muscle to stretch the target muscle. Muscles of older individuals are more susceptible to injury during eccentric contractions and are slower to recover from trauma (3). PNF might cause a higher risk of injury due to the body's slower recovery rate and that's why it is best to use static stretching techniques as opposed to PNF or ballistic techniques in elderly people.

Aerobic Exercise

Aerobic exercise comprises a multitude of health benefits. The inclusion of aerobic exercise decreases the risk of heart attack, reduces cholesterol, lowers high blood pressure, reduces the likelihood of developing diabetes, and increases lung capacity. According to ACSM guidelines for adults, the basic recommendations for cardiorespiratory exercise are: at least 150 minutes of moderate-intensity exercise per week, exercise recommendations can be met through 30-60 minutes of moderate-intensity exercise (five days per week) or 20-60 minutes of vigorous-intensity exercise (three days per week).
One continuous session and multiple shorter sessions (of at least 10 minutes) are both acceptable to accumulate desired amount of daily exercise. Gradual progression of exercise time, frequency and intensity is recommended for best adherence and least injury risk (1). Some examples of moderate intense (60-70% of MHR) aerobic exercise are walking briskly for about 3.5 mph, hiking, gardening/yard work, dancing, golf (walking and carrying clubs), and bicycling (less than 10 mph). Some examples of vigorous intense (70-80% of MHR) aerobic exercise are running (5 mph), bicycling (more than 10 mph), swimming (freestyle laps), walking very fast (4.5 mph), heavy yard work (chopping wood), and competitive basketball.
Identifying your target heart rate zone or your rate of perceived exertion (RPE) will help to distinguish between moderate or vigorous activity. For the healthy adult, a target heart rate zone of 60-70% of your age predicted heart rate max would be considered moderate. The formula is (220-Age= Heart Rate Max x 0.6) and (220-Age=Heart Rate Max) x 0.7. These two numbers are the age predicted target heart rate zones of 60-70%.
The Borg RPE scale (see Table 1) can determine a target heart rate zone based on an individual's estimate of how hard his/her body is working on a scale of 6-20. This can be used in place of tracking your heart rate for indoor and outdoor activities if you do not have access to a heart rate monitor. Perceived exertion is how hard you feel your body is working. The value is unique to each individual and their tolerance/response to physical activity. It is based on the physical sensations you experience during a bout of physical activity which includes your response to an increasing heart rate, increasing breathing rate, increasing perspiration, and increasing muscle fatigue.
A goal for the healthy adult is to create a program of exercise that at minimum compensates for the risks of the inactive lifestyle and at best prepares them to follow the adult's requirement for exercise (27).

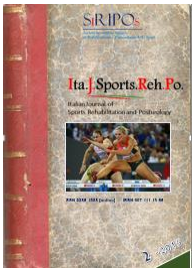


Table 1

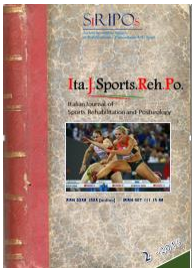
Rating of Perceived Exertion Borg RPE Scale		
6 7 8 9 10 11	Very, very light Very light Fairly light	How you feel when lying in bed or sitting in a chair relaxed. Little or no effort.
12 13 14 15 16	Somewhat hard Hard	Target range: How you should feel with exercise or activity.
17 18 19 20	Very hard Very, very hard Maximum exertion	How you felt with the hardest work you have ever done. Don't work this hard!

Anaerobic Exercise

Anaerobic exercise improves functional capacity and slows down the degeneration of muscle mass. Some of the benefits of anaerobic exercise include managing stress, enhancing self-esteem, increase in physical capacity, injury prevention and rehabilitation, osteoporosis prevention and management, and maintenance of fat free weight/ lean muscle mass. According to ACSM guidelines, adults should perform 8-10 strength training exercises, 8-12 repetitions of each exercise 2-3 times per week. The exercises should work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).

Initially, function should be the main focus of an exercise program. In order to perform all the movements that are necessary in daily activity, proper movement patterns should first be identified. This can be done through a fitness assessment by a qualified trainer. These functional movements should include: squat, lunge, push, pull, rotate, isolate, and gait. However, variations of these exercises can be modified to suit the needs of the individual. This could include a glute bridge instead of a deadlift, a wall sit instead of a squat, a dead bug instead of a sit up, etc. The exercise program should be modified according to an individual's habitual physical activity, physical function, health status, exercise responses, and stated goals (11).

Given an adequate training stimulus, older adults can make significant gains in strength. A two- to threefold increase in strength can be accomplished in three to four months in fibers recruited during training in older adults (8). Because sarcopenia is so prevalent in the aging population, it is important to create appropriate exercise programs to preserve or increase muscle mass in the older adult. With increasing muscle strength come increased levels of daily activity in older adults.



Balance

Balance training can improve coordination, proprioception, athletic skill, and posture. This in turn will result in fewer injuries and greater stability as you age, which can help prevent falls and keep you both strong and independent longer. Falling is one of the most common problems with the elderly that cause bone fractures and breaks. Approximately 30% of falls result in an injury that requires medical attention, and approximately 10% result in a fracture. Fall prevention is an important strategy for reducing osteoporotic fractures (2).

There is evidence that exercise can help reduce the risk of falls. Older adults should be encouraged to exercise to decrease the chance of an injury due to a fall. There are different modalities available to practice balance exercises, such as: hospital based tools, at home tools, exercise machines, and computer technology analysis. Even practicing body awareness by standing with your eyes closed for as long as possible without falling could be a good starting point for some individuals. There are more advanced techniques involving balance beams, rocker boards, half foam rollers, balance pads, and resistance bands.

Some of the major benefits of balance training include neuromuscular coordination, stabilization through specific muscular activation, muscle fiber recruitment, and hip and core stabilization. The majority of these benefits will help with posture and in return keep the body is a center of balance.

Simply performing balance exercises 3x/week can help prevent falls and help strengthen the stabilizer muscles of the legs and hips. No matter the age, balance training should be incorporated in an exercise program.

Assessing Fitness

The results on an initial fitness evaluation dictate the design, prescription, and implementation of an exercise program. Fitness assessments are critical as they provide the fitness professional and client baseline analytics concerning vital statistics, body composition, exercise capacity, and movement capacity. Prior to conducting of a fitness assessment, a health history questionnaire must be completed by the client and thoroughly reviewed by the fitness professional for potential risk factors and contraindications. Age is considered a risk factor since the likelihood of developing disease increases throughout the lifespan. The cumulative effects of poor health behaviors, such as sedentarism, poor nutrition, and tobacco usage) may manifest themselves as conditions which interfere with certain screening protocols. Prior to exercise testing, a determination to conduct an assessment is made from existent risk factors (see Table 2).

The appropriateness of exercise testing protocols is determined by contraindicated conditions or symptoms presented by the client. Exercise testing is not appropriate for individuals with absolute contraindications (see Table 3), whereas testing is allowable for individuals with relative contraindications, provided that the benefit from testing outweighs the risk and provisions are made during the administration of a fitness examination, such as modifying testing protocols, lowering age estimated maximum heart rate endpoints, or permitting perceptual feedback from the client

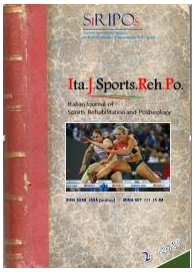


Table 2

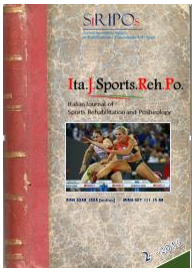
Coronary Artery Disease Risk Factor Thresholds for Use with ACSM Risk Stratification	
Risk Factor	Defining Criteria
Age	Men ≥45 yrs; Women ≥ 55 yrs
Family History	Heart attack, 'Bypass surgery', or sudden death before the age of 55 yrs for father/brother; or 65 yrs for mother/sister.
Cigarette smoking	Current smoker, or have quit < 6 months, or is exposed to environmental smoke.
Sedentary lifestyle	Not participating in moderate (that makes you sweat) physical activity at least 3 days/week for 3-months.
Obesity	Body mass index ≥ 30 kg/m^2 or waist girth > 102 cm (40 in) for men 88 cm (35 in) for women.
Hypertension	Systolic Blood Pressure ≥ 140 mmHg and or Diastolic ≥ 90 mmHg, or taking medication.
Dyslipidemia	LDL ≥ 130 mg/dl, or HDL < 40 mg/dl, or taking medication.
Pre-diabetes	IFG ≥ mg/dl or OGTT ≥ 140 and ≤ 199 mg/dl confirmed by two different measurements.
Negative Risk Factor	
HDL	≥ 60 mg/dl

(By ACSM's Guidelines for Exercise Testing & Prescription. LWW, 2014 (p. 27).

Table 3

Contraindications to Exercise Testing	
Absolute	Relative
A recent significant change in the resting ECG suggesting significant ischemia, recent myocardial infarction (within 2 days), or other acute cardiac event	Left main coronary stenosis
Unstable angina	Moderate stenotic valvular heart disease
Uncontrolled cardiac dysrhythmias causing symptoms or hemodynamic compromise	Electrolyte abnormalities (e.g., hypokalemia, hypomagnesemia)
Symptomatic severe aortic stenosis	Severe arterial hypertension (i.e., systolic BP of > 200 mmHg and/or a diastolic BP of > 110 mmHg) at rest
Uncontrolled symptomatic heart failure	Tachydysrhythmia or bradydysrhythmia
Acute pulmonary embolus or pulmonary infarction	Neuromuscular, musculoskeletal, or rheumatoid disorders that are exacerbated by exercise
Acute myocarditis or pericarditis	High-degree atrioventricular block (e.g., two or more consecutive P-waves are blocked) (33)
Suspected or known dissecting aneurysm	Ventricular aneurysm
Acute systemic infection, accompanied by fever, body aches, or swollen lymph gland	Uncontrolled metabolic disease (e.g., diabetes, thyrotoxicosis, or myxedema)
	Chronic infectious disease (e.g., mononucleosis, hepatitis, AIDS)
	Mental or physical impairment leading to inability to exercise adequately

(By Gibbons, RA, Balady, GJ, Beasley JW, et al. ACC/AHA guidelines for exercise testing. J Am College Cardiol 30:260-315, 1997.)



Designing and Administering Fitness Assessments for Senior Populations

Testing protocols should be adjusted to the abilities of the client. Rikli and Jones created the Senior Fitness Test (see Table 4), which is comprised of a battery of testing protocols to evaluate a number of fitness qualities, including: lower and upper body strength, aerobic endurance, lower and upper body flexibility, balance, and BMI.

Table 4

Senior Fitness Test	
Test	Fitness Quality
Chair Stand: Number of times within 30 sec a person can stand from a seated position with arms folded across the chest.	Lower Body Strength
Arm Curl: Number of curls that can be completed in 30 sec with a dumbbell 4 pound weight (women, AAHPERD), 5 pound weight (women, SFT), 8 pound weight (for men). Seated in a chair without armrests.	Upper Body Strength
6 minute walk: Number of yards the participant can walk in 6 min around a 46 m (50 yd) course.	Aerobic Endurance
2 minute step: Number of full steps the participant can complete in 2 min, raising knee to midway between knee and hip while standing in place.	Aerobic Endurance
Chair sit and reach: Number of inches between extended fingertips and tips of toes when the participant is sitting in a chair with legs extended and hands reaching toward toes.	Lower Body Flexibility
Back scratch: Number of inches between the extended middle fingers when the participant reaches one hand over the shoulder and the other hand up the back.	Upper Body Flexibility
8 Foot Get up and go: Number of seconds required to get up from a seated position, walk 2.4 m (8 ft), turn, and return to the seated position.	Agility and Dynamic Balance
Stork Balance Stand Test: Place the hands on the hips, then position the non-supporting foot against the inside knee of the supporting leg. The subject raises the heel to balance on the ball of the foot.	Balance
Measurements of height and weight	Body Mass Index

(By Rikli, R.E. and Jones, C.J. 2001. Senior fitness test manual. Champaign, IL: Human Kinetics).

A number of tools to assess movement have been recently introduced to the fitness and performance training communities (see Table 5). The Functional Movement Screen (FMS) has been embraced by fitness and rehabilitation professionals an efficacious protocol in assessing musculoskeletal functioning. The protocol which was developed by Gray Cook, utilizes a series of non-fatiguing tests intended to screen for imbalances and asymmetries throughout the kinetic chain. The tests are scored and clients are provided exercises based on data extrapolated from the test. The application of each test largely depends on the client's abilities.

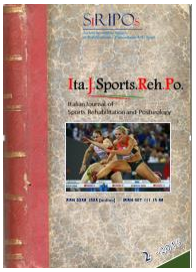


Table 5

Functional Movement Screen	
Test	Purpose
Deep Squat	Assesses bilateral, symmetrical, and function mobility of the hips, knees, and ankles.
Hurdle Step	Assesses bilateral functional mobility and stability of the hips, knees, and ankles.
Inline Lunge	Assesses torso, shoulder, hip, and ankle mobility and stability, quadriceps flexibility, and knee stability.
Active Straight Leg Raise	Assesses extensibility of hamstring and gastrocnemius of raised leg, extensibility of quadriceps of opposite leg, and lumbopelvic stability.
Trunk Stability Push Up	Assesses the ability to maintain a neutral spine during the performance of a push up.
Shoulder Mobility	Assesses bilateral shoulder range of motion.
Rotary Stability	Assesses multiplanar stability during combined motions of the upper and lower extremities.

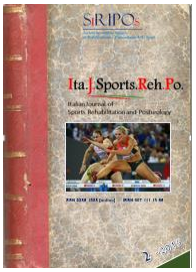
(By Cook, G. *Movement*. Santa Cruz, CA: On Target Publications, 2010. pp. 87-106.)

In our experiences, we have found some elderly individuals lack proprioceptive awareness and strength to perform some of the tests included within the Senior Fitness Test and Functional Movement Screen, therefore proposing a test replete with safer alternatives (see Table 6).

Table 6

Proposed Senior Fitness Test	
Test	Intended Purpose
Glute Bridge	Assesses lumbopelvic stability and rhythm. May be performed for time or repetitions.
Hand grip dynamometer	Assesses isometric crushing grip strength.
Static Single Legged Posture	Assesses balance, multiplanar lumbopelvic stability, and isometric hip flexor strength.
Unilateral Dumbbell Farmer's Walk with 4.5 kg (10 lb) dumbbell for women and 6.8 kg (15 lb) dumbbell for men.	Assesses ipsilateral lumbopelvic and shoulder stability, grip strength, and total body muscular endurance.
Ruler Drop Test	Assesses reaction time.
"Talk" Test	Assesses aerobic capacity.
Coin Pick Up	Assesses coordination, balance, mobility, and fine motor skills.

(By American College of Sports Medicine. *Guidelines for Exercise Testing and Prescription.* Indiana: Indianapolis, 27, 2014)



Forming the framework of an initial exercise prescription can now be organized (see Table 7). Incorporating the different components allows for a well-rounded approach.
This includes aerobic exercise, anaerobic exercise, flexibility, and balance. Lastly, as determined by the health history and fitness assessment, determine the client's health risk (healthy, sedentary, or medically restricted). A healthy adults displays no major cardiovascular risk factors, a sedentary adult may display one or two cardiovascular risk factors, and a medically restricted adult displays a major cardiovascular risk factor (stroke, diabetes, heart attack, major surgery within past six months, etc).

Table 7

INITIAL EXERCISE PRESCRIPTIONS				
Clients	**Aerobic**	**Anaerobic**	**Flexibility**	**Balance**
Healthy Adult	Moderate 30 min/day 5x/week or vigorous 20 min/day 3x/week	2-3 days/wk 70-80% of 1RM Full Body 3-4 sets, 6-8 reps	2-3 days/wk Mild discomfort Full body 2-3 sets, 10-30 sec	2-3 days/wk Low intensity Stand on one foot, eyes closed 15 sec
Sedentary Adult	moderate intensity 30 min/day 5x/wk	2-3 days/wk 60-70% of 1RM Full Body 2-3 sets, 8-12 reps	2-3 days/wk Mild discomfort Full body 2-3 sets, 10-30 sec	2-3 days/wk Low intensity Stand on one foot 15 sec
Medically Restricted Adult	Non exercise physical activity Light house chores, gardening, etc	2-3 days/wk 50-60% of 1RM Full Body 1+ sets, 12-15 reps	2-3 days/wk Low to Mild discomfort Full body 2-3 sets, 10-30 sec	2-3 days/wk Low intensity Eyes closed test/reach test 10 sec

The strength training program should contain exercises that target all the major muscles groups. This limits the possibility of muscular imbalances and addresses muscular weaknesses. The strength program will also assist with posture, balance, and flexibility due to the muscles being put through a full range of motion (as anatomically as possible) and an increase in muscular proprioception. Depending on the category of the client's health, the program selected should reflect his/her abilities (see Tables 8, 9, and 10).

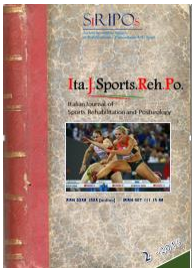


Table 8

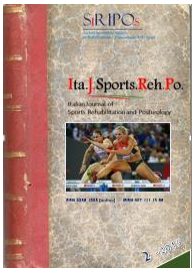
Sample Strength Training Program for Healthy Adult		
Exercise	**Number of Repetitions**	**Number of Sets**
Goblet Squat	6-8	3-4
Dumbbell Romanian Deadlifts	6-8	3-4
Chest Press	6-8	3-4
Lat Pulldown	6-8	3-4
Shoulder Press	6-8	3-4
Seated Row	6-8	3-4
Triceps Extension	6-8	3-4
Bicep Curls	6-8	3-4
Dead Bugs	6-8	3-4

Table 9

Sample Strength Training Program for Sedentary Adult		
Exercise	**Number of Repetitions**	**Number of Sets**
Chair Squat	8-12	2-3
Glute Bridge	8-12	2-3
Wall Push Up	8-12	2-3
Standing Banded Row	8-12	2-3
Standing Banded Hip Abduction	8-12	2-3
Standing Banded Lat Raise	8-12	2-3
Standing Banded Bicep Curls	8-12	2-3
Bird Dog	8-12	2-3
TAC Holds	8-12	2-3

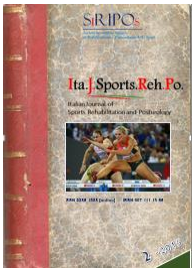
Table 10

Sample Strength Training Program for Medically Restricted Adult		
Exercise	**Number of Repetitions**	**Number of Sets**
Seated Leg Raises	12-15	1
Standing Calf Raises	12-15	1
Arm Circles	12-15	1
Seated Banded Pulldowns	12-15	1
Seated Lat Raises	12-15	1
Seated Banded Rows	12-15	1
Seated Bicep Curls	12-15	1
TAC Holds	12-15	1



Conclusion

The longevity of older adults and their interest in health will create a great opportunity for fitness professionals to work with this population. Fitness professionals need to educate themselves fully regarding the effects of age on health and daily activity. The benefits of regular exercise will help stave off the risk factors of disease by improving musculoskeletal health, neurocognitive functioning, respiratory functioning, cardiovascular health, flexibility, and balance. All these benefits associated with regular exercise will improve the quality of life and health of the aging adult. However, many serious considerations must be weighed in the development and implementation of an exercise program due to the aging process. Older adults can safely participate in regular exercise programs within an individualized scope of their abilities as determined by their family history, fitness assessment, testing, and goals. Proper programming for the older adult will contribute to a healthier, more independent, and improved quality of life for our population's fastest-growing sector.



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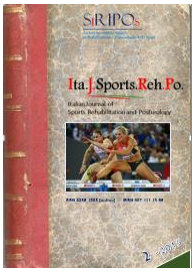

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Ita. J. Sports Reh. Po.

Italian Journal of
Sports Rehabilitation and Posturology

Italian Journal of Sports Rehabilitation and Posturology ISSN 2385-1988 [online] - IBSN 007-111-19-55
Società Scientifica Italiana di Riabilitazione e Posturologia dello Sport C.F. 90060850592
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