Training Older Adults in Small Groups

How to Build a Fit Body Forever!

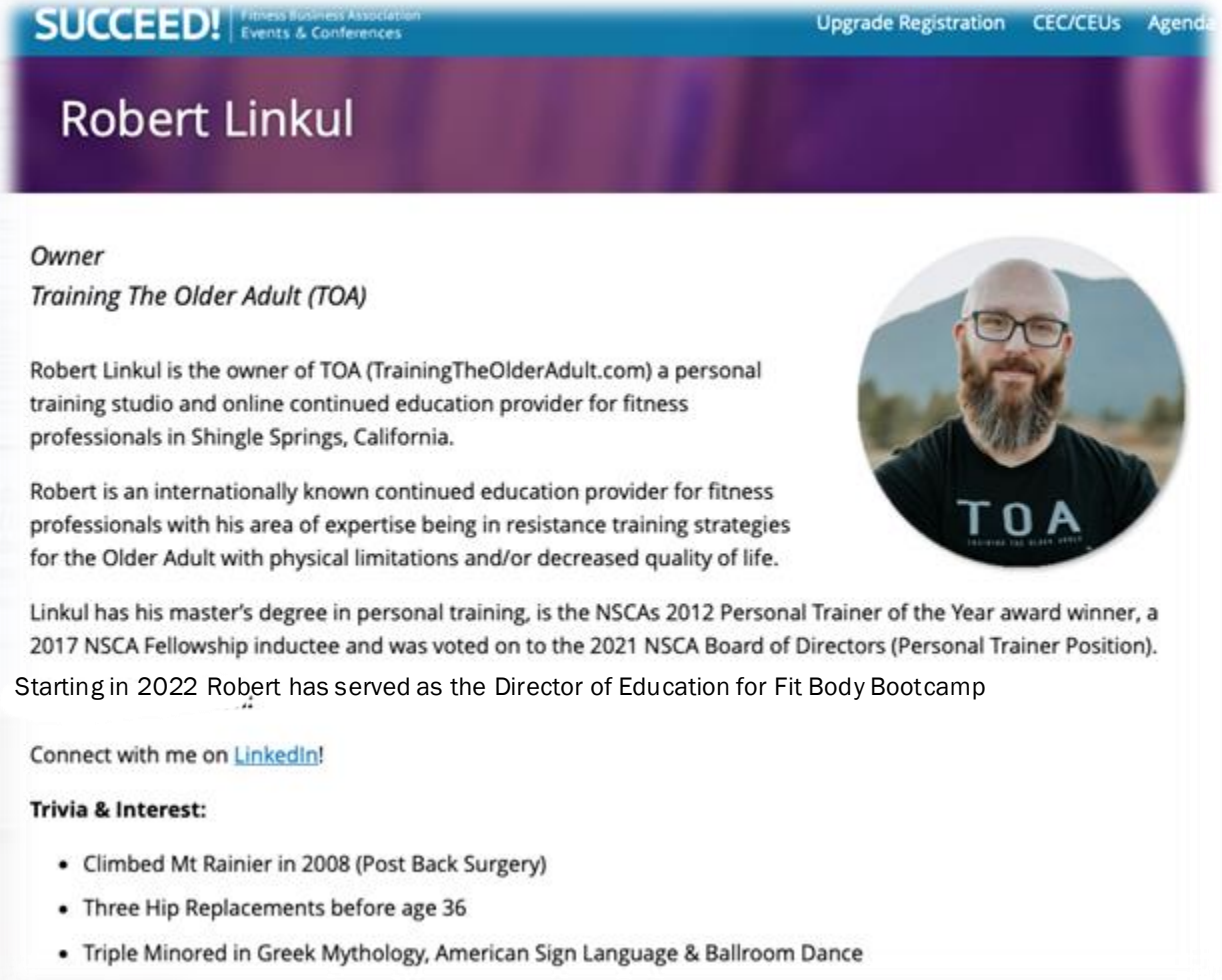
With Robert Linkul
MS CSCS*D NSCA-CPT*D FNSCA TOA*D
Owner of TrainingTheOlderAdult.com

Agenda

- Meet Robert
- The Problem – Sarcopenia
- The Solution – HIRT/HVRT
- The Design – Proper Programming
- The Implementation – Exercise Prog.
- Off Days – Welcome to Rucking
- Final Thoughts – Review

Training the Older Adult (TOA) & Fit Body Forever (FBF)

- Masters Degree in Personal Training (2008)
- Bachelors Degree in Kinesiology (2005)
- NSCA CSCS*D (2005)
- NSCA CPT*D (2012)
- NSCA Fellowship Inductee (2017)
- NSCA Trainer of the Year (2012)
- NSCA Board of Directors (2021-2024)
- 25 Years of Experience (I Started at 19!)



What is Sarcopenia?

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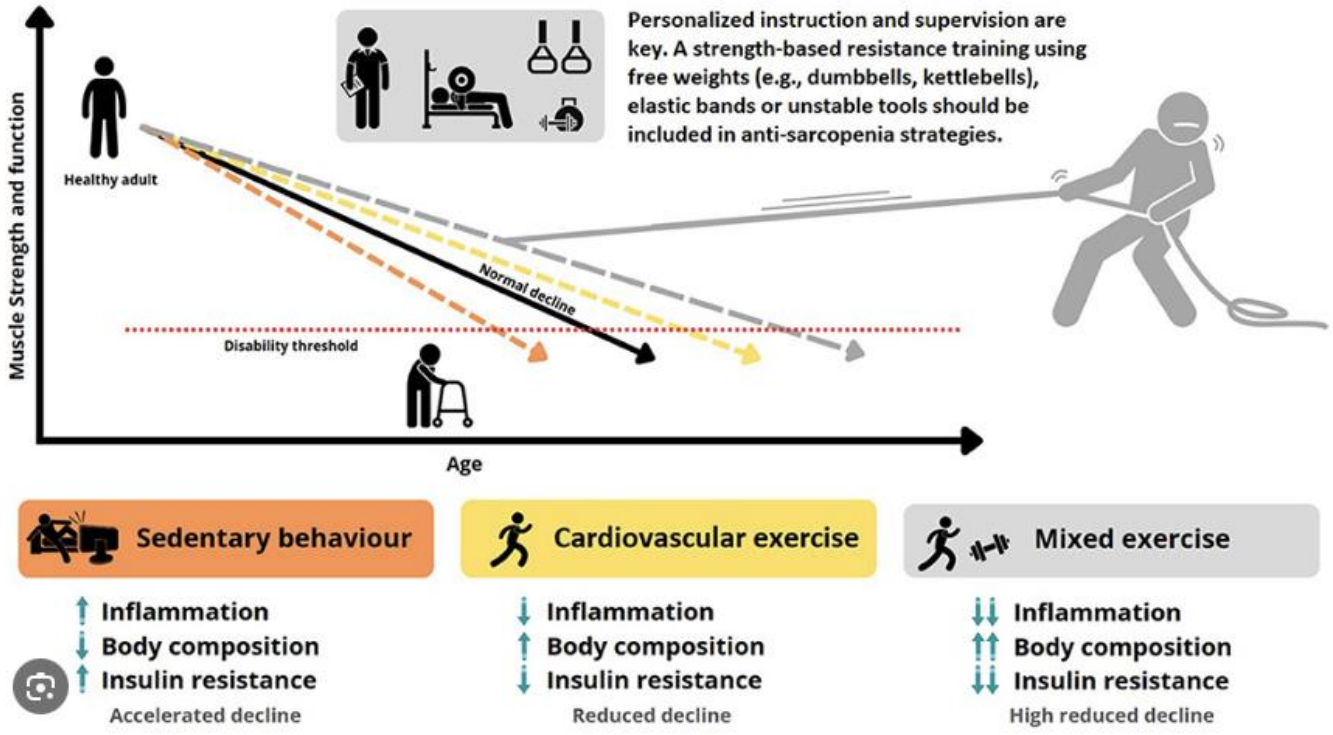


What is Sarcopenia?

The Lost of Muscle Mass & Function
(Not Necessarily Age Related)

Definition:

Sarcopenia is the Age-Related Loss of Muscle Mass & Function

My Definition:

Sarcopenia is the Loss of Muscle Mass & Function Due to Severe Deconditioning in Aging Bodies

2016 = Declared an Official Disease by the CDC

Breaking Down the Definition:

Sarco-Penia: Loss of Muscle Mass & Function
Dyna-Penia: Loss of Muscular Strength
Potentia-Penia: Loss of Muscular Power

Sports Medicine (2023) 53:2281–2282
https://doi.org/10.1007/s40279-023-01919-9

LETTER TO THE EDITOR

Check for updates

Comment on: "Power Training Prescription in Older Individuals: Is it Safe and Effective to Promote Neuromuscular Functional Improvements?"

Ronald E. Michalak[1]

Accepted: 18 August 2023 / Published online: 14 September 2023

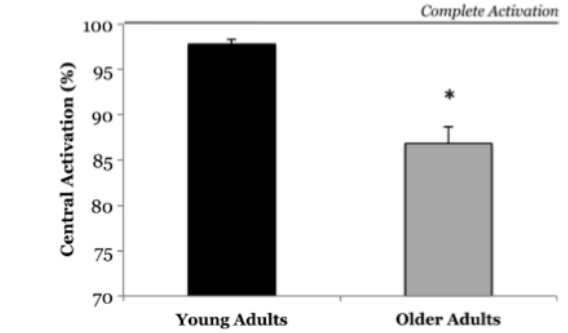
Sarcopenia is generally considered a loss of muscle mass. A quick literature search revealed the first four mentions of sarcopenia in 1993 [3–6]. Since 1993, there have been 17,184 additional references to sarcopenia. Since having a name, sarcopenia has garnered research and clinical attention. However, sarcopenia still lacks consensus on clear diagnostic criteria [7].

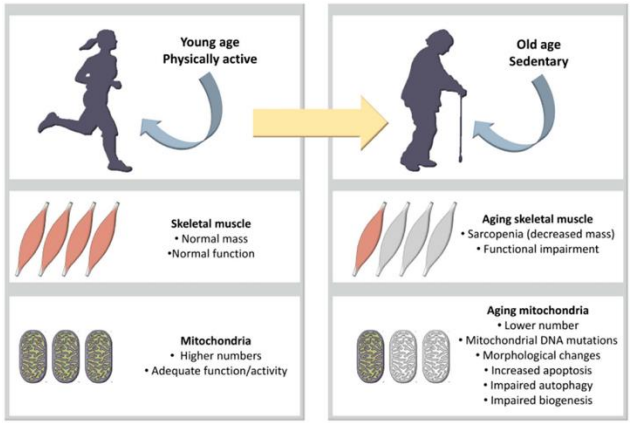
The first reference to *dynapenia* that I could locate was by Clark and Manini in 2008 [8], who made the case that *dynapenia* (loss of strength) is a related but separate quality to *sarcopenia*, loss of muscle mass. Since 2008, there have been 359 additional references to *dynapenia*. Since having a

How to name it? First, look up the definition of 'power' in the physics section of Wikipedia [10]. Then, use the translate function on this website to see that 'potentia' is the Latin translation of the word power. Therefore, I would propose calling the loss of muscular power *potentiapenia*.

Proposed operational definitions:

- *Sarcopenia* Loss of muscle mass
- *Dynapenia* Loss of muscular strength
- *Potentiapenia* Loss of muscular power





The Loss of Muscle Mass

The Loss of Function Due to the Loss of Muscle Mass

* Acute – Short Term 12 Weeks or Less
  Injury, Car Accident, Surgery, etc.
* Chronic – Long Term 12+ Weeks
  Deconditioned & Untrained

NOT Necessarily Due to the Aging Process

250% Increase in All Caused Mortality

Dynapenia

The Loss of Muscular Strength

The Loss of Function

NOT Due to the Aging Process

Responsible for Poor Posture & Structural Support

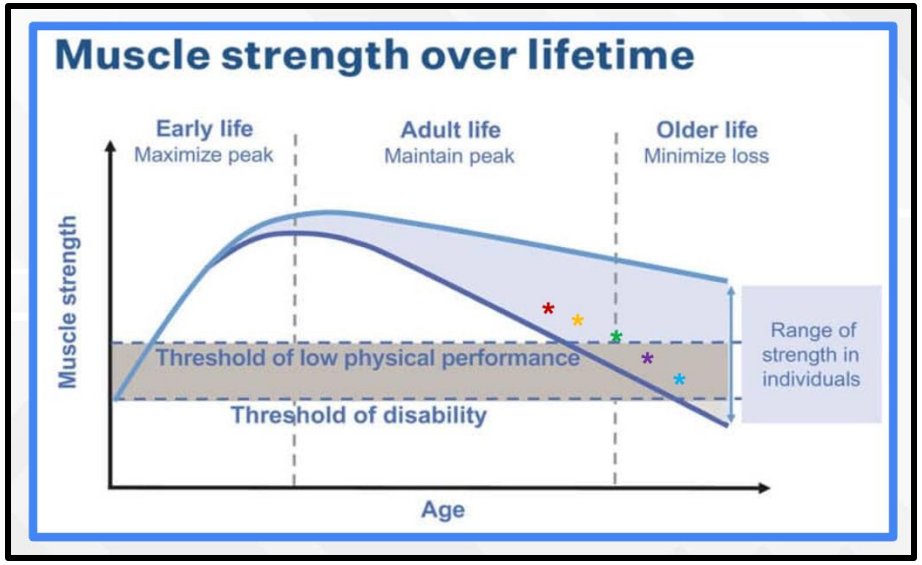
Potentiapenia

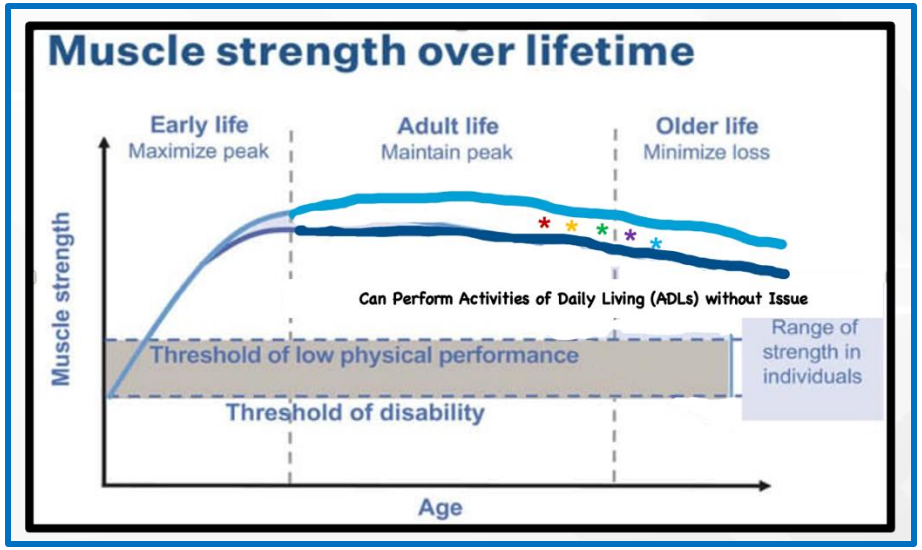
The Loss of Muscular Power

The Loss of Function

NOT Due to the Aging Process

Responsible for Increased Risk of Falls





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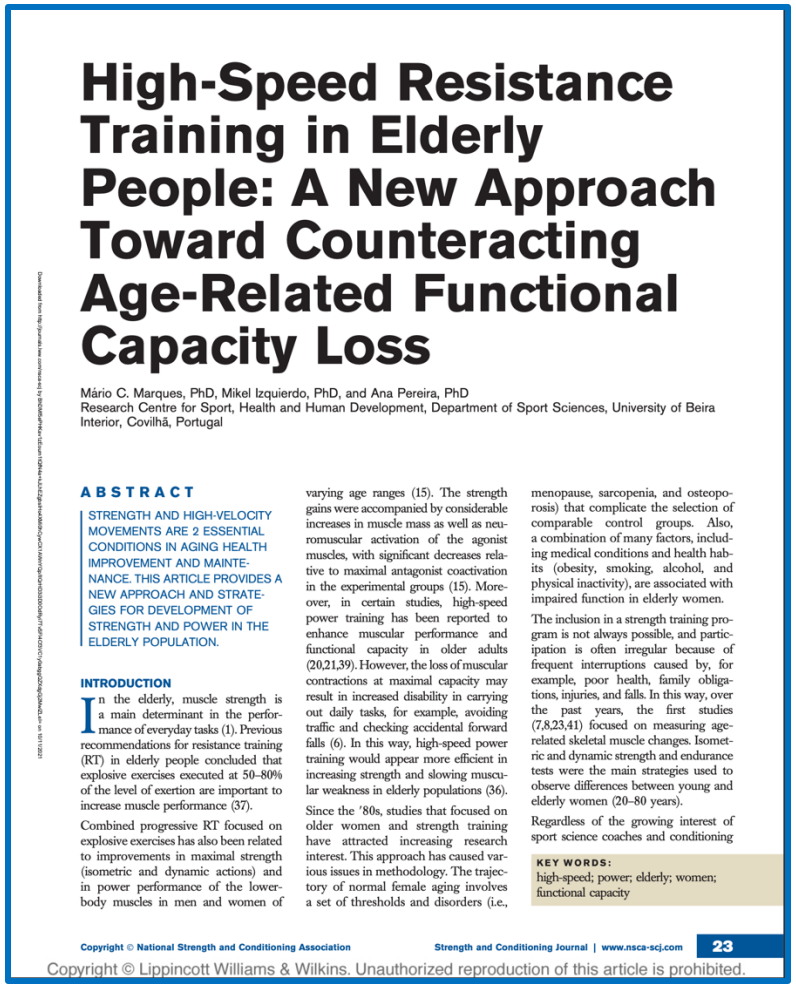

High-Speed Resistance Training in Elderly People: A New Approach Toward Counteracting Age-Related Functional Capacity Loss

Mário C. Marques, PhD, Mikel Izquierdo, PhD, and Ana Pereira, PhD
Research Centre for Sport, Health and Human Development, Department of Sport Sciences, University of Beira Interior, Covilhã, Portugal

ABSTRACT

STRENGTH AND HIGH-VELOCITY MOVEMENTS ARE 2 ESSENTIAL CONDITIONS IN AGING HEALTH IMPROVEMENT AND MAINTENANCE. THIS ARTICLE PROVIDES A NEW APPROACH AND STRATEGIES FOR DEVELOPMENT OF STRENGTH AND POWER IN THE ELDERLY POPULATION.

INTRODUCTION

In the elderly, muscle strength is a main determinant in the performance of everyday tasks (1). Previous recommendations for resistance training (RT) in elderly people concluded that explosive exercises executed at 50–80% of the level of exertion are important to increase muscle performance (37).

Combined progressive RT focused on explosive exercises has also been related to improvements in maximal strength (isometric and dynamic actions) and in power performance of the lower-body muscles in men and women of varying age ranges (15). The strength gains were accompanied by considerable increases in muscle mass as well as neuromuscular activation of the agonist muscles, with significant decreases relative to maximal antagonist coactivation in the experimental groups (15). Moreover, in certain studies, high-speed power training has been reported to enhance muscular performance and functional capacity in older adults (20,21,39). However, the loss of muscular contractions at maximal capacity may result in increased disability in carrying out daily tasks, for example, avoiding traffic and checking accidental forward falls (6). In this way, high-speed power training would appear more efficient in increasing strength and slowing muscular weakness in elderly populations (36).

Since the '80s, studies that focused on older women and strength training have attracted increasing research interest. This approach has caused various issues in methodology. The trajectory of normal female aging involves a set of thresholds and disorders (i.e., menopause, sarcopenia, and osteoporosis) that complicate the selection of comparable control groups. Also, a combination of many factors, including medical conditions and health habits (obesity, smoking, alcohol, and physical inactivity), are associated with impaired function in elderly women.

The inclusion in a strength training program is not always possible, and participation is often irregular because of frequent interruptions caused by, for example, poor health, family obligations, injuries, and falls. In this way, over the past years, the first studies (7,8,23,41) focused on measuring age-related skeletal muscle changes. Isometric and dynamic strength and endurance tests were the main strategies used to observe differences between young and elderly women (20–80 years).

Regardless of the growing interest of sport science coaches and conditioning

KEY WORDS:
high-speed; power; elderly; women; functional capacity

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https://doi.org/10.1007/s11357-022-00520-8

ORIGINAL ARTICLE

High-velocity resistance training mitigates physiological and functional impairments in middle-aged and older adults with and without mobility-limitation

Gustavo Z. Schaun · Marcas M. Bamman · Luana S. Andrade · Gabriela B. David · Vitor L. Krüger · Eduardo F. Marins · Gabriela N. Nunes · Mariana S. Häfele · Graciele F. Mendes · Maria Laura B. Gomes · Paula C. Campelo · Stephanie S. Pinto · Cristine L. Alberton

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What is HIRT & HVRT

How It Helps Us Overcome Sarcopenia

High Intensity Resistance Training (HIRT)

- Moving "Moderate-Heavy" Load
  - 60-80% Of One Repetition Max
  - 6-8 on Rate of Perceived Exertion (RPE)
- Increases Bone Density
  - 12-18 Months = 1-2.5% Increase (Ave.)
- Increases Lean Muscle Mass
  - Reducing Body Fat
- Increase Muscle Mass
  - Increases Muscular Density (Type I & II)
  - Increases Actin & Myosis Binding Sights
- Increased Dynamic M&A Reduces Fall Risk

High Velocity Resistance Training (HVRT)

- Moving "Moderate-Heavy" Load
  - 40-60% Of One Repetition Max
  - 4-6 on Rate of Perceived Exertion (RPE)
- Increases Golgi-Tendon Response
  - Detectors of Muscle Tension & Force (More Power)
- Increases Lean Muscle Mass
  - Reducing Body Fat
- Increase Muscle Mass
  - Type II Muscle Fiber
  - Type II Fibers Increased Dynamic Mobility & Ability
- Increased Dynamic M&A Reduces Fall Risk

High Intensity
Resistance Training

The Perfect Fit – Overcoming Sarcopenia

- Three to Six Complex Movements
  - 1st in the Workout Order
  - Biggest Muscles Groups Earlier in the Workout
  - Smaller Muscle Groups Later in the Workout
- Two to Three Auxiliary Movement
  - 2nd in Workout Order (Finisher/Burnout)
- Repetitions Between Eight & Twenty
  - Sometimes Higher Depending on the Experience of the Group

- Programmed Workload
  - BEST Work to Rest Ratio = 2:1 (30:15)(40:20) etc.
  - Run Through the List Two to Five Rounds
  - 2-4 Sets with 8-15 Repetitions (or 6-30)
  - 15 to 30 Minutes (No Longer)
- Recovery Times:
  - :10-:30 Between Sets
  - :30-:90 After Each Round
- Selecting Load
  - Rate of Perceived Exertion
  - 7-10 Pure Strength (Dynapenia)
  - 4-6 HVRT (Potentiapenia)
  - 6-8 HIRT

Three Steps of How to Select Proper Load

How to Select the Proper Load for Older Adults: Criteria for Success and Reduced Risk of Injury

Although the following three questions are quite simple, they are often overlooked or simply ignored in the general scheme of program design for any client, let alone the older adult. By addressing these three criteria, the strength and conditioning professional or personal trainer should be able to select loads safely and efficiently for their participants on a regular basis (49).

Table 4.4 Volume Guide for Training the Older Adult

Reps	Sets	Load	Tempo	Recovery
6-15	2-4 per exercise	40%-80% 1RM; 4-8 RPE	2:1 Standard 3:1 Eccentric 4:1 Eccentric	30-60 s

Note: 1RM = 1-repetition maximum; RPE = rate of perceived exertion.

1. Can the client perform the number of repetitions set as the goal?

   We Ask For 8 Repetitions of Deadlifts with 24 kilos (53lbs)
   Client Performs 8 Repetitions of Deadlifts with 24 kilos (53lbs)

2. Can the client perform the number of repetitions and the exercise with the proper technique throughout the entire set?

   We Ask For 8 Repetitions of Deadlifts with 24 kilos (53lbs)
   Client Performs 8 Repetitions of Deadlifts with 24 kilos (53lbs)
   With Proper Technique for ALL 8 Repetitions

3. Can the client perform the number of repetitions with the proper technique at the lifting tempo that is required?

   We Ask For 8 Repetitions of Deadlifts with 24 kilos (53lbs)
   Client Performs 8 Repetitions of Deadlifts with 24 kilos (53lbs)
   With Proper Technique for ALL 8 Repetitions
   With a 3:1 [Eccentric : Concentric) Tempo
   Without Compromise

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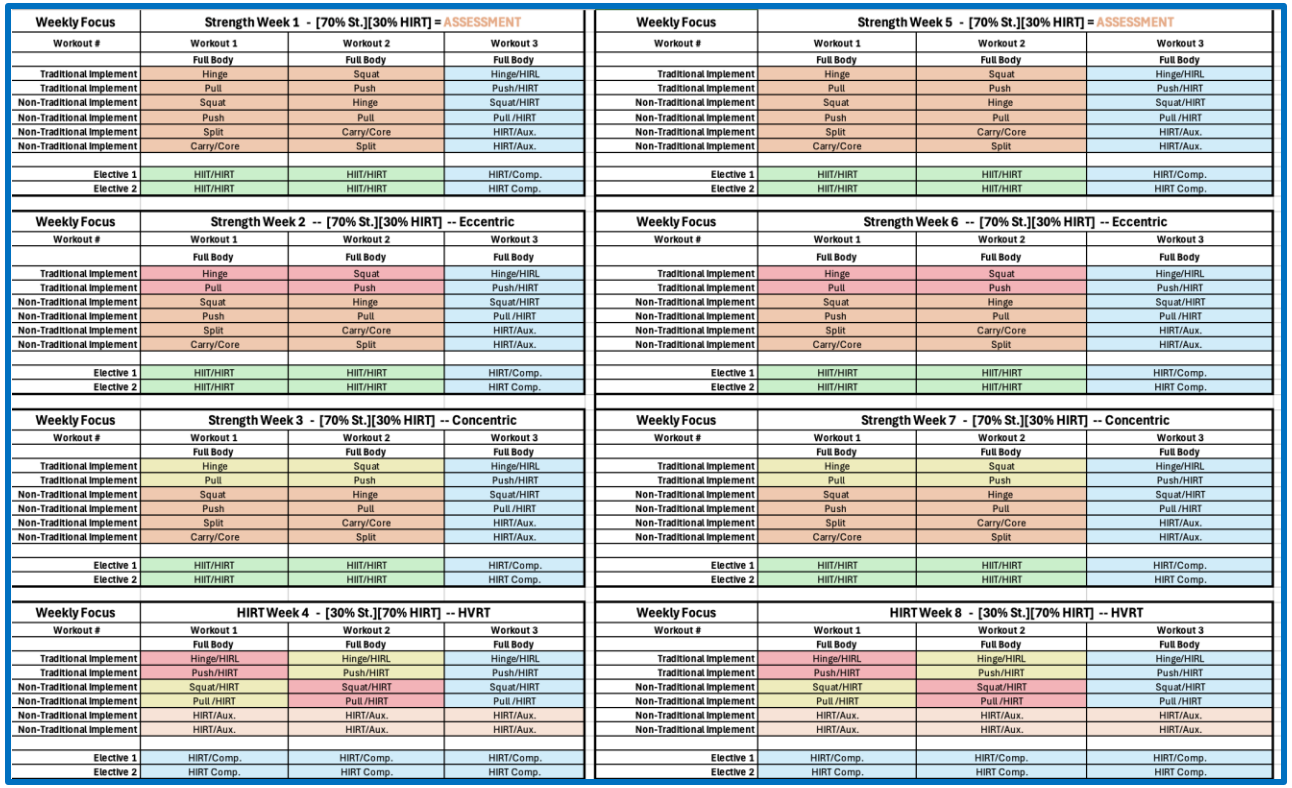


Weekly Focus	Strength Week 1 - [70% St.][30% HIRT] = ASSESSMENT		
Workout #	Workout 1	Workout 2	Workout 3
	Full Body	Full Body	Full Body
Traditional Implement	Hinge	Squat	Hinge/HIRL
Traditional Implement	Pull	Push	Push/HIRT
Non-Traditional Implement	Squat	Hinge	Squat/HIRT
Non-Traditional Implement	Push	Pull	Pull /HIRT
Non-Traditional Implement	Split	Carry/Core	HIRT/Aux.
Non-Traditional Implement	Carry/Core	Split	HIRT/Aux.
Elective 1	HIIT/HIRT	HIIT/HIRT	HIRT/Comp.
Elective 2	HIIT/HIRT	HIIT/HIRT	HIRT Comp.

Weekly Focus	Strength Week 2 -- [70% St.][30% HIRT] -- Eccentric		
Workout #	Workout 1	Workout 2	Workout 3
	Full Body	Full Body	Full Body
Traditional Implement	Hinge	Squat	Hinge/HIRL
Traditional Implement	Pull	Push	Push/HIRT
Non-Traditional Implement	Squat	Hinge	Squat/HIRT
Non-Traditional Implement	Push	Pull	Pull /HIRT
Non-Traditional Implement	Split	Carry/Core	HIRT/Aux.
Non-Traditional Implement	Carry/Core	Split	HIRT/Aux.
Elective 1	HIIT/HIRT	HIIT/HIRT	HIRT/Comp.
Elective 2	HIIT/HIRT	HIIT/HIRT	HIRT Comp.

Weekly Focus	Strength Week 3 - [70% St.][30% HIRT] -- Concentric		
Workout #	Workout 1	Workout 2	Workout 3
	Full Body	Full Body	Full Body
Traditional Implement	Hinge	Squat	Hinge/HIRL
Traditional Implement	Pull	Push	Push/HIRT
Non-Traditional Implement	Squat	Hinge	Squat/HIRT
Non-Traditional Implement	Push	Pull	Pull /HIRT
Non-Traditional Implement	Split	Carry/Core	HIRT/Aux.
Non-Traditional Implement	Carry/Core	Split	HIRT/Aux.
Elective 1	HIIT/HIRT	HIIT/HIRT	HIRT/Comp.
Elective 2	HIIT/HIRT	HIIT/HIRT	HIRT Comp.

Weekly Focus	HIRT Week 4 - [30% St.][70% HIRT] -- HVRT		
Workout #	Workout 1	Workout 2	Workout 3
	Full Body	Full Body	Full Body
Traditional Implement	Hinge/HIRL	Hinge/HIRL	Hinge/HIRL
Traditional Implement	Push/HIRT	Push/HIRT	Push/HIRT
Non-Traditional Implement	Squat/HIRT	Squat/HIRT	Squat/HIRT
Non-Traditional Implement	Pull /HIRT	Pull /HIRT	Pull /HIRT
Non-Traditional Implement	HIRT/Aux.	HIRT/Aux.	HIRT/Aux.
Non-Traditional Implement	HIRT/Aux.	HIRT/Aux.	HIRT/Aux.
Elective 1	HIRT/Comp.	HIRT/Comp.	HIRT/Comp.
Elective 2	HIRT Comp.	HIRT Comp.	HIRT Comp.

Weekly Focus	Strength Week 5 - [70% St.][30% HIRT] = ASSESSMENT		
Workout #	Workout 1	Workout 2	Workout 3
	Full Body	Full Body	Full Body
Traditional Implement	Hinge	Squat	Hinge/HIRL
Traditional Implement	Pull	Push	Push/HIRT
Non-Traditional Implement	Squat	Hinge	Squat/HIRT
Non-Traditional Implement	Push	Pull	Pull /HIRT
Non-Traditional Implement	Split	Carry/Core	HIRT/Aux.
Non-Traditional Implement	Carry/Core	Split	HIRT/Aux.
Elective 1	HIIT/HIRT	HIIT/HIRT	HIRT/Comp.
Elective 2	HIIT/HIRT	HIIT/HIRT	HIRT Comp.

Weekly Focus	Strength Week 6 -- [70% St.][30% HIRT] -- Eccentric		
Workout #	Workout 1	Workout 2	Workout 3
	Full Body	Full Body	Full Body
Traditional Implement	Hinge	Squat	Hinge/HIRL
Traditional Implement	Pull	Push	Push/HIRT
Non-Traditional Implement	Squat	Hinge	Squat/HIRT
Non-Traditional Implement	Push	Pull	Pull /HIRT
Non-Traditional Implement	Split	Carry/Core	HIRT/Aux.
Non-Traditional Implement	Carry/Core	Split	HIRT/Aux.
Elective 1	HIIT/HIRT	HIIT/HIRT	HIRT/Comp.
Elective 2	HIIT/HIRT	HIIT/HIRT	HIRT Comp.

Weekly Focus	Strength Week 7 - [70% St.][30% HIRT] -- Concentric		
Workout #	Workout 1	Workout 2	Workout 3
	Full Body	Full Body	Full Body
Traditional Implement	Hinge	Squat	Hinge/HIRL
Traditional Implement	Pull	Push	Push/HIRT
Non-Traditional Implement	Squat	Hinge	Squat/HIRT
Non-Traditional Implement	Push	Pull	Pull /HIRT
Non-Traditional Implement	Split	Carry/Core	HIRT/Aux.
Non-Traditional Implement	Carry/Core	Split	HIRT/Aux.
Elective 1	HIIT/HIRT	HIIT/HIRT	HIRT/Comp.
Elective 2	HIIT/HIRT	HIIT/HIRT	HIRT Comp.

Weekly Focus	HIRT Week 8 - [30% St.][70% HIRT] -- HVRT		
Workout #	Workout 1	Workout 2	Workout 3
	Full Body	Full Body	Full Body
Traditional Implement	Hinge/HIRL	Hinge/HIRL	Hinge/HIRL
Traditional Implement	Push/HIRT	Push/HIRT	Push/HIRT
Non-Traditional Implement	Squat/HIRT	Squat/HIRT	Squat/HIRT
Non-Traditional Implement	Pull /HIRT	Pull /HIRT	Pull /HIRT
Non-Traditional Implement	HIRT/Aux.	HIRT/Aux.	HIRT/Aux.
Non-Traditional Implement	HIRT/Aux.	HIRT/Aux.	HIRT/Aux.
Elective 1	HIRT/Comp.	HIRT/Comp.	HIRT/Comp.
Elective 2	HIRT Comp.	HIRT Comp.	HIRT Comp.

Key Components to Resistance Training
= Functional Movement Patterns for Program Design

Six Daily Life Movements

- Sit to Stand → Squat
- Properly Pick Things Up → Hinge
- Press/Reach Over Head → Push/Press
- Rows/Pull Toward Body → Pull/Row
- Step Up & Down (Stairs) → Split Stance/Gait
- Carry Heavy Load → Loaded Carry

Fitness Movement Components

- Squat
- Hinge
- Push/Press
- Pull/Row
- Split Stance/Gait
- Loaded Carry

Two Daily Needs

Muscular Strength

Anti-Sarcopenia

Muscular Endurance

Cardiovascular Endurance

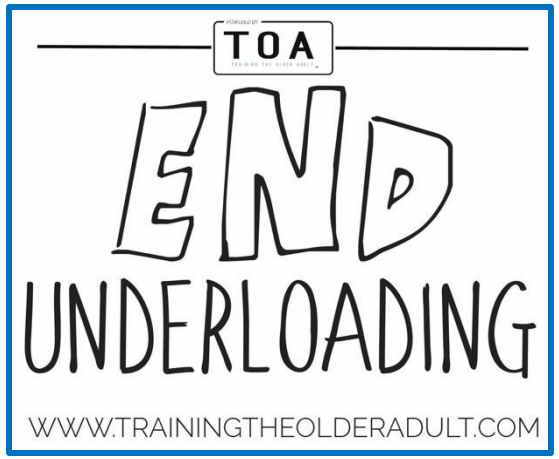
Training Modalities

Mobility/Stability/Balance

- Up & Down from Floor
- Fall Prevention/Power Production

Cardiovascular Health

Building a Fit Body That is Resistant to Sarcopenia Forever



Monday & Wednesday's Workout

Warm Up
8 Minutes of Dynamic Mobility
Six Point/Hinge/Upper/Lower/Three Step

Strength (Zone 2) Station 1
7-10 Minutes (ABCx3 Format)
Lift Heavy BUT with Perfect Technique
Don't Hurt Yourself/Do Push Yourself

Strength (Zone 2) Station 2
7-10 Minutes (ABCx3 Format)
Lift Heavy BUT with Perfect Technique
Don't Hurt Yourself/Do Push Yourself

Finisher
3-5 Minutes

Cool Down
2+ Minutes

Fun Friday Workout

Warm Up
8 Minutes of Dynamic Mobility
Six Point/Hinge/Upper/Lower/Three Step

HIRT (Zone 2-3) Rotating Stations
High Intensity Resistance Training
35+ Minutes of GO!
Push Yourself, Get Uncomfortable
Discomfort is Where Change Occurs

ALL Training Points Back to:
= Maintain Independence &
Fight Off Sarcopenia

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Training the Older Adult (TOA) **"Updated"** **Blueprint Program Design**

Lifting Components	Beginner	Intermediate	Advanced
Hinges (Component 1)	[ ] Loaded Bridge [ ] Foot Elevated Bridge (Band & Load) [ ] Shoulder Elevated Bridge (Band & Load) [ ] Standing Slams	[ ] Band Stiff Leg Hinge [ ] Loaded Stiff Leg Hinge (RDL) [ ] Kickstand Hinge (Band & Load) [ ] Band Loaded Swings (Below & Behind)	[ ] Loaded Rack Pulls (Band Deload) [ ] Goblet Sit to Stand (Band & Load) [ ] Kettlebell Swing [ ] Loaded Belt Squat
Rows (Component 2)	[ ] Mini-Band Single Arm Row [ ] Band Supinated/Prontated Chest Pull [ ] Band Single Arm Pull Start [ ] Band Bow & Arrow Row	[ ] Loaded Three Point Alt. Row [ ] Landmine Bent Over Row [ ] Loaded Pull Over [ ] Pulley Straight Arm Pull Down	[ ] Pulley Seated Row [ ] Pulley Kneeling Pull Down [ ] Loaded High "T" Pulls [ ] Inverted Rows
Pushes & Over Head Actions (Component 3)	[ ] Proper Push Ups [ ] Loaded SA Over Head Press & Pull [ ] Loaded Rotational SA Press [ ] Loaded Shoulder Raises [all three]	[ ] Band Reverse Push Up [ ] Pulley Single Arm Chest Press [ ] Band Decline Chest Press [+ Rip Stick] [ ] Landmine Two Hand Press [+ Band]	[ ] Loaded Floor Press [Swiss Bar] [ ] Landmine Single Arm Press [+ Band] [ ] Dual Tension Over Head Press [ ] Loaded Rotational Bench Press
Split Stance (Component 4)	[ ] Band Gait Steps (at hip) [ ] Band Deloaded Step Ups [ ] Band Deloaded Split Squats [ ] Band Aided Step Ups	[ ] Loaded Gait Steps [ ] Loaded Single Leg Step Ups [ ] Loaded Split Squats [ ] Loaded Drop Step Lunges	[ ] Band + Loaded Gait Steps (at hip) [ ] Band + Anti-Rot. Overload Step Ups [ ] Loaded Rear Leg Elev. Split Squats [ ] Loaded Curtsie Lunge
Loaded Carries (Component #5)	[ ] Band Isometric Lateral Hold [ ] Suticase Carry [ ] Farmer Carry [ ] Shopping Cart Carry	[ ] Waiter Carry [Single & Double] [ ] Pfister Carry [Single & Double] [ ] Un-Even Load Carry [ ] Combination Carry	[ ] Sling & Carry [ ] Zurcher Carry [ ] Get Ups/Bear Crawls [ ] Prowler Push/Sled Pull
High Intensity Resistance Training [HIRT] Complexex & Auxillary	[ ] **Loaded Triplex** [ ] **Loaded Shoulder Series** [ ] **Loaded Sorinex Curls** [ ] **Loaded SL or Kick Stand RDLs**	[ ] **Loaded Hinge & Row** [ ] **Loaded Hinge & High Pull** [ ] **Loaded Squat & Press** [ ] **Loaded Drop Step Lunge & OH Press**	[ ] **Loaded Close Grip Snatch** [ ] **Loaded Single Arm Snatch** [ ] **Loaded Squat & Neider Press** [ ] **Loaded Step Up & Heartbeat**
Pivot Points & Power Production [Modality #1]	[ ] Loaded Pivot Point Chest/OH Press [ ] Loaded Pivot Point Row [ ] Sandbell Kneeling Slams [ ] Sandball Seated Chest Pass [ ] Sandball Seated Chest Pass Up & Overs	[ ] Loaded SA Pivot Point Chest/OH Press [ ] Loaded SA Pivot Point Row [ ] Sandbell Hinged Slams [ ] Sandball Chest Pass Horizontal [ ] Sandball Chest Pass Up & Over	[ ] Load+Band Pivot Point C/OH Press [ ] Load+Band Pivot Point Row [ ] Sandball BTL Vertical Toss [Height] [ ] Sandball BTL Horizontal [Distance] [ ] Sandball Lateral Toss [Distance]
Fall Prevention [Modality #2]	Balance: Inline Hold Inline Hold Balance Pad Inline Hold Pirate Eyes Implement Tracking: Unilateral or Contralateral Self Bounces on Floor/Wall (Sinlge Leg/Pad/Pirate Style)	Balance Single Leg Hold Single Leg Hold Balance Pad Single Leg Pirate Eyes Implement Tracking: Medball Return Chest Pass Medball Return Shot Puts Medall Return Over Head	Balance: Single Leg with Load Ropes or Inertia Waves Dumbbells or Fatbells Implement Tracking: Partner Chest Pass Partner Shot Puts Partner Over Head

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Hinges (Component 1)	[ ] Loaded Bridge [ ] Foot Elevated Bridge (Band & Load) [ ] Shoulder Elevated Bridge (Band & Load) [ ] Standing Slams	[ ] Band Stiff Leg Hinge [ ] Loaded Stiff Leg Hinge (RDL) [ ] Kickstand Hinge (Band & Load) [ ] Band Loaded Swings (Below & Behind)	[ ] Loaded Rack Pulls (Band Deload) [ ] Goblet Sit to Stand (Band & Load) [ ] Kettlebell Swing [ ] Loaded Belt Squat
Rows (Component 2)	[ ] Mini-Band Single Arm Row [ ] Band Supinated/Prontated Chest Pull [ ] Band Single Arm Pull Start [ ] Band Bow & Arrow Row	[ ] Loaded Three Point Alt. Row [ ] Landmine Bent Over Row [ ] Loaded Pull Over [ ] Pulley Straight Arm Pull Down	[ ] Pulley Seated Row [ ] Pulley Kneeling Pull Down [ ] Loaded High "T" Pulls [ ] Inverted Rows
Pushes & Over Head Actions (Component 3)	[ ] Proper Push Ups [ ] Loaded SA Over Head Press & Pull [ ] Loaded Rotational SA Press [ ] Loaded Shoulder Raises [all three]	[ ] Band Reverse Push Up [ ] Pulley Single Arm Chest Press [ ] Band Decline Chest Press [+ Rip Stick] [ ] Landmine Two Hand Press [+ Band]	[ ] Loaded Floor Press [Swiss Bar] [ ] Landmine Single Arm Press [+ Band] [ ] Dual Tension Over Head Press [ ] Loaded Rotational Bench Press
Split Stance (Component 4)	[ ] Band Gait Steps (at hip) [ ] Band Deloaded Step Ups [ ] Band Deloaded Split Squats [ ] Band Aided Step Ups	[ ] Loaded Gait Steps [ ] Loaded Single Leg Step Ups [ ] Loaded Split Squats [ ] Loaded Drop Step Lunges	[ ] Band + Loaded Gait Steps (at hip) [ ] Band + Anti-Rot. Overload Step Ups [ ] Loaded Rear Leg Elev. Split Squats [ ] Loaded Curtsie Lunge
Loaded Carries (Component #5)	[ ] Band Isometric Lateral Hold [ ] Suticase Carry [ ] Farmer Carry [ ] Shopping Cart Carry	[ ] Waiter Carry [Single & Double] [ ] Pfister Carry [Single & Double] [ ] Un-Even Load Carry [ ] Combination Carry	[ ] Sling & Carry [ ] Zurcher Carry [ ] Get Ups/Bear Crawls [ ] Prowler Push/Sled Pull
High Intensity Resistance Training [HIRT] Complexex & Auxillary	[ ] **Loaded Triplex** [ ] **Loaded Shoulder Series** [ ] **Loaded Sorinex Curls** [ ] **Loaded SL or Kick Stand RDLs**	[ ] **Loaded Hinge & Row** [ ] **Loaded Hinge & High Pull** [ ] **Loaded Squat & Press** [ ] **Loaded Drop Step Lunge & OH Press**	[ ] **Loaded Close Grip Snatch** [ ] **Loaded Single Arm Snatch** [ ] **Loaded Squat & Neider Press** [ ] **Loaded Step Up & Heartbeat**
Pivot Points & Power Production [Modality #1]	[ ] Loaded Pivot Point Chest/OH Press [ ] Loaded Pivot Point Row [ ] Sandbell Kneeling Slams [ ] Sandball Seated Chest Pass [ ] Sandball Seated Chest Pass Up & Overs	[ ] Loaded SA Pivot Point Chest/OH Press [ ] Loaded SA Pivot Point Row [ ] Sandbell Hinged Slams [ ] Sandball Chest Pass Horizontal [ ] Sandball Chest Pass Up & Over	[ ] Load+Band Pivot Point C/OH Press [ ] Load+Band Pivot Point Row [ ] Sandball BTL Vertical Toss [Height] [ ] Sandball BTL Horizontal [Distance] [ ] Sandball Lateral Toss [Distance]
Fall Prevention [Modality #2]	Balance: Inline Hold Inline Hold Balance Pad Inline Hold Pirate Eyes Implement Tracking: Unilateral or Contralateral Self Bounces on Floor/Wall (Sinlge Leg/Pad/Pirate Style)	Balance Single Leg Hold Single Leg Hold Balance Pad Single Leg Pirate Eyes Implement Tracking: Medball Return Chest Pass Medball Return Shot Puts Medall Return Over Head	Balance: Single Leg with Load Ropes or Inertia Waves Dumbbells or Fatbells Implement Tracking: Partner Chest Pass Partner Shot Puts Partner Over Head

What is Sarcopenia?

- Meet Robert
- The Problem – Sarcopenia
- The Solution – HIRT/HVRT
- The Design – Proper Programming
- The Implementation – Exercise Prog.
- Off Days – Welcome to Rucking
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IMPLEMENTING RUCK TRAINING (LOADED WALKING) WITH THE AGING ADULT

ROBERT LINKUL, MS, CSCS,*D, NSCA-CPT,*D, FNSCA

It is fairly common for older adults to experience some type of physical limitation over the years, which can lead to a decrease in their physical ability. Running, biking, swimming, and other physical activities might be too much for their bodies to handle. However, walking is a simple skill that almost everyone can continue to do as they age. Walking allows for the ability to improve or maintain a stable and balanced gait, improve cardiovascular health, and help create a caloric deficit.

Simply put, rucking is loaded walking (a version of loaded carries) for distance. Ruck training is a version of performing loaded carries that can assist in developing full body strength (anti-sarcopenia), improve bone density (anti-osteopenia), and help the aging population maintain their ability to walk as they age. Therefore, the physical activity of "rucking" can aid the aging individuals battle sarcopenia and osteopenia by carrying load with them on their daily walks. The following provides a simple guide to ruck training for the aging population.

CHOOSING THE LOAD FOR RUCK TRAINING

Rucking can be broken down into two components: load and distance.

The first thing that needs to be selected for the program design will be the load that is carried. Load selection will be based on a percentage of the client's body weight. As a starting point, the author recommends to begin ruck training by choosing to carry around a load that is 10% of the individual's body weight in a ruck (back pack), or in a loaded vest for their first few weeks of training. This can serve as general baseline because the body needs an adaptation phase of 2 – 3 weeks of walking with a light load prior to any increases (1). This adaptation phase allows the body to recognize a new demand being placed on it.

As a general rule of rucking, the author also recommends the client avoid using a load that exceeds 30% of their body weight to begin rucking. This is because excessive loading can increase the risk of skeletal injury and place a great deal of stress on the muscular system (4). The same issues can come about if the load is progressed too quickly. Steady progressive increases of five percent every two or three weeks can be used as a general guideline until the client achieves 30% of their body weight in week 11. Once that is achieved, the client is free to undulate their load as the program states or as they see fit.

The average person takes roughly 2,000 steps to walk a mile at body weight (without load) (4). The addition of a ruck or vest weighing 15 lb introduces an extra 30,000 lb (15 pounds x 2,000 steps) of stress being placed on the body's frame. This type of stress can cause shin splints, swollen or achy feet, low back discomfort, neck and shoulder pain, and several other issues if the body is not ready for such a demand. This is where a gradual introduction of load is necessary along with a resistance training program that will assist in building bone density and strength needed to improve rucking performance. Table 1 outlines a progression of load, frequency and distance for the beginning rucker to start their training program.

SELECTING FREQUENCY

The second component of a rucking program design is the frequency in which the rucks occur. In the beginning of the sample program for beginners (Table 1) there are two rucks performed each week. Each ruck should be performed with 48 – 72 hr of rest occurring between sessions. The days between rucking should include some mobility, flexibility, and stability work, as well as some resistance training workouts. As the client advances into their training program, they will have weeks in which the number of rucks and resistance training sessions are increased to three times per week. Tables 2 and 3 are mock up outlines of a two-ruck week and a three-ruck week three-week training cycle, respectively.

SELECTING DISTANCE

The third component of rucking program design is the distance in which the client is going to cover. The author prefers to select distance based on mileage (instead of by time), and then record the time frame in which that distance is achieved. An average range of 15 – 25 minutes per mile (with a load of 10 – 20% of body weight) is a good time frame to aim for.

As shown in the sample program, the client starts off slowly with a one-mile ruck. This first ruck will set a baseline for their current level of fitness. Over the 12 weeks of training, the client will increase their efforts up to four miles (60 – 100 min) ruck with the intention of improving their mile average. In the sample program provided, every third week the client is directed to "seek hills" in their rucking rout. Including hill training into their rucking will increase their work capacity due to the increased challenge. The client should record their elevation gained in their ruck if they use a smart technology watch that provides such a function.

Hill training will probably reduce the client's average mile time, which is normal. The purpose of seeking hills is to increase the client's work capacity (tidal volume), muscular endurance, muscular strength, and ability to overcome the challenge of the elevation gained on each hill. The physical improvements gained from hill training will aid the client on non-hill rucks by improving their mile splits and overall time.

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Introducing Rucking into Your Program

Ruck Training

Guidelines:

- Ruck or Vest
  - Vest for 15-30 Minutes or Less
  - Rucks for 30+ Minutes
  - Size & Fit Maters a LOT
- Load to Carry
  - Women 5 to 15% of Body Weight
  - Men 10 to 30% of Body Weight
  - 150lbs or Under (10-20lbs)
  - 150lbs or Above (20-40lbs)
- How Often
  - One to Two Time a Week (Beginners)
  - Two to Three Times a Week (Advanced)
- How Far
  - One to Two Miles (Beginners)
  - Three to Five Miles (Intermediates)
- Recovery Time:
  - Two Days (Typically)
  - Do Maintenance Work:
    - Ankles & Shins
    - Low Back & Shoulders
- Remember:
  - Hydrate Before Big Rucks & Bring More Water Than You'll Need
  - Eat Healthy & Bring Snacks
  - Wear Reflective Gear & Use Illumination (Head Lamp, Lights, etc.)
  - Look Both Ways
  - Don't Talk to Strangers
  - Walk Against Traffic
  - Have FUN!

PTQ 9.1

TABLE 1. SAMPLE PROGRAM FOR BEGINNERS

	LOAD	FREQUENCY	DISTANCE
Week 1	10%	2 Sessions (48 Hours Apart)	1 Mile
Week 2	10%	2 Sessions (48 Hours Apart)	1 Miles
Week 3	10-15%	2 Sessions (48 Hours Apart)	1.5 Miles (Seek hills)
Week 4	15%	2 Sessions (48 Hours Apart)	1.5 Miles
Week 5	15%	2 Sessions (48 Hours Apart)	2 Miles
Week 6	15-20%	2 Sessions (48 Hours Apart)	2 Miles (Seek hills)
Week 7	20%	3 Sessions (48 Hours Apart)	3 Miles
Week 8	20%	3 Sessions (48 Hours Apart)	3 Miles
Week 9	20-25%	3 Sessions (48 Hours Apart)	3 Miles (Seek hills)
Week 10	25%	3 Sessions (48 Hours Apart)	4 Miles
Week 11	30%	3 Sessions (48 Hours Apart)	3 Miles
Week 12	25%	3 Sessions (48 Hours Apart)	4 Miles (Seek hills)

TABLE 2. SAMPLE TRAINING CYCLE WITH TWO TIMES PER WEEK
Two Rucks Per Week: Weeks 1 – 6

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Ruck	REST		Ruck (Short)			REST	Ruck (Long)
Resistance Training		Full Body			Full Body		
Mobility		Mobility (10-15 Minutes)		Mobility (10-15 Minutes)			Mobility (10-15 Minutes)

How Do We Overcome Sarcopenia?

Step #2 Rucking (Loaded Walking)

- Two Rucks Per Week
  - Short (Tuesday) 1-2 Miles with Heavier Load (15lbs)
  - Long (Friday) 2-5 Miles with Lighter Load (10lbs)
- Load
  - Start with 5-10lbs
  - Increase by 2-5lbs Every Other Weeks Until 10% of Body Weight is Achieved
- Distance
  - Start Off with a 10 Minute Ruck or One Mile (which ever comes first)
  - Increase Distance by ¼ - ½ Mile Every Other Week Until Three Miles is Achieved

Two Rucks Per Week: Weeks 1-3, 7, 10

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Ruck	REST		Ruck (Short)			REST	Ruck (Long)
Resistance Training		Full Body			Full Body		
Mobility		Mobility (10-15 Minutes)		Mobility (10-15 Minutes)			Mobility (10-15 Minutes)

Three Rucks Per Week: Weeks 4-6, 8-9, 11-12

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Ruck	REST		Ruck (Short)		Ruck (Short)		Ruck (Long)
Resistance Training		Full Body		Full Body		Full Body	
Mobility		Mobility (10-15 Minutes)		Mobility (10-15 Minutes)		Mobility (10-15 Minutes)	

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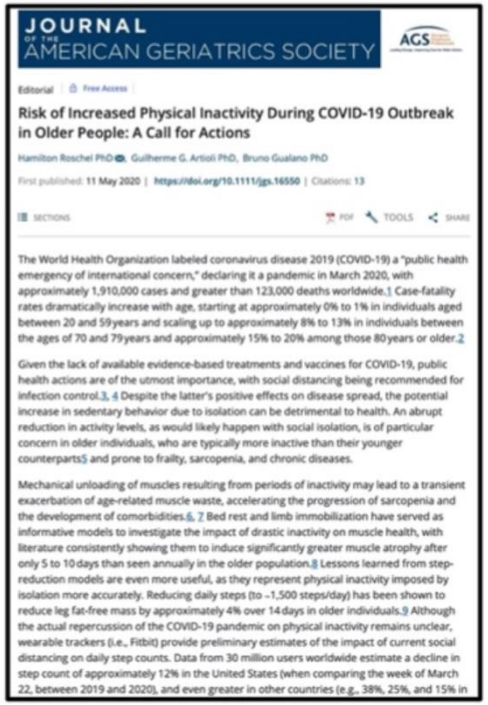
How Quick Can Sarcopenia Happen?

Results from 14 Day Stay-At-Home Quarantine in those Over the Age of 59



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Risk of Increased Physical Inactivity During COVID-19 Outbreak in Older People: A Call for Actions

Hamilton Roschel PhD, Guilherme G. Artioli PhD, Bruno Gualano PhD

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The World Health Organization labeled coronavirus disease 2019 (COVID-19) a "public health emergency of international concern," declaring it a pandemic in March 2020, with approximately 1,910,000 cases and greater than 123,000 deaths worldwide.1 Case-fatality rates dramatically increase with age, starting at approximately 0% to 1% in individuals aged between 20 and 59 years and scaling up to approximately 8% to 13% in individuals between the ages of 70 and 79 years and approximately 15% to 20% among those 80 years or older.2

Given the lack of available evidence-based treatments and vaccines for COVID-19, public health actions are of the utmost importance, with social distancing being recommended for infection control.3, 4 Despite the latter's positive effects on disease spread, the potential increase in sedentary behavior due to isolation can be detrimental to health. An abrupt reduction in activity levels, as would likely happen with social isolation, is of particular concern in older individuals, who are typically more inactive than their younger counterparts5 and prone to frailty, sarcopenia, and chronic diseases.

Mechanical unloading of muscles resulting from periods of inactivity may lead to a transient exacerbation of age-related muscle waste, accelerating the progression of sarcopenia and the development of comorbidities.6, 7 Bed rest and limb immobilization have served as informative models to investigate the impact of drastic inactivity on muscle health, with literature consistently showing them to induce significantly greater muscle atrophy after only 5 to 10 days than seen annually in the older population.8 Lessons learned from step-reduction models are even more useful, as they represent physical inactivity imposed by isolation more accurately. Reducing daily steps (to ~1,500 steps/day) has been shown to reduce leg fat-free mass by approximately 4% over 14 days in older individuals.9 Although the actual repercussion of the COVID-19 pandemic on physical inactivity remains unclear, wearable trackers (i.e., Fitbit) provide preliminary estimates of the impact of current social distancing on daily step counts. Data from 30 million users worldwide estimate a decline in step count of approximately 12% in the United States (when comparing the week of March 22, between 2019 and 2020), and even greater in other countries (e.g., 38%, 25%, and 15% in

Before Pandemic Average Person Step Count
= 6,000 steps per day

During 14 Day Stay-At-Home Quarantine
= Average was 1,500 steps per day
= Decreased by 75%
= 4% reduction in fat free body mass
= 8% reduction in muscular strength
= 6% reduction in power
Two-week Post-Rehabilitation Training Sessions
Failed to Rebuild Lost Muscle Mass

"Two weeks of inactivity has been shown to decrease muscle strength by approximately 8%, and despite a seemingly low value, 2 weeks of rehabilitation were ineffective in recovering muscle function, emphasizing the impact of abrupt reductions in physical activity in an already vulnerable population"

Two Days of Immobilization
- Early Onset of Atrophy
- 1.7% Muscle Volume Loss

Seven Days of Immobilization
- Full Atrophy
- 5.5% Muscle Volume Loss

10 Days of Immobilization
- Early Onset of Sarcopenia

14 Days of Immobilization
- Full Sarcopenia
- 6% Decrease in Power Production
- 8%+ Decrease in Strength Production
- 5.5%+ Loss of Muscle Mass

Thank You So Much!!

- RobertLinkul@gmail.com
- TrainingTheOlderAdult.com
- YouTube.com/RobertLinkul

toa mentorship

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