

Live to Ascend

Predictive and Preventative
Health & Wellness Solutions

Dr. Zach Rynders, PT, DPT

LTA Program Overview

Live to Ascend delivers a comprehensive health & wellness solution for facilities committed to providing a superior health and wellness experience for their residents.

Designed by a Doctor of Physical Therapy and Strength and Conditioning Specialist, we are a team of health and education professionals implementing a program founded in science and backed by years of medical research.

Our mission is to redefine what healthy aging means. We will re-write clinical guidelines for how to successfully train seniors to reduce falls, increase independence, and maximize longevity.

LTA Program Overview

Customized blend of innovative strength, cardio, machine circuit, aqua fitness, yoga, tai chi, and specialty classes led by a DPT

Balance training and mobility incorporated into classes with 87% of participants exhibiting a clinically significant reduction in fall risk

Strength, endurance, balance, and power assessments performed for data-driven outcomes

Outcomes reduce falls, maintain and increase independence, lower risk of cost of care, decrease all-cause mortality, and improve the well-being of residents

Physical Activity and Aging

Understanding the Benefits of Exercise Across the
Lifespan

Learning Objectives

- Understand the physiological changes of aging as they relate to physical activity/inactivity
- Present and interpret current data on falls
- Define the systems that contribute to balance
- Review fall risk assessments AND future research projects of LTA
- Explain how to assess balance, strength, and power (speed)
- Next webinar will define **what** we do in exercise programs, why, and the results we are getting

Physical Activity

- Aging is a complex phenomenon involving multiple biological pathways at the cellular level.
- **The aging process is accelerated by inactivity,** poor nutrition, and lifestyle choices such as smoking.
- Physical Activity works at the cellular level to slow down the aging process and improve **healthy** life expectancy

Epidemiological Evidence


- So how do we know physical activity effects health and life expectancy?
- Research consistently indicates physical activity is associated with reduced overall mortality as well as reduced death from CV disease or cancer.
- **This effect is almost as powerful as the benefit of avoiding smoking!!!**
- Dose dependent relationship between PA and life expectancy
- You should see exercise as **preventative** medicine

Epidemiology of Falls

- Data on falls can vary greatly due to variance in definition of falls, data collection and reporting, etc.
- Falls are the leading cause of unintentional injury and hospitalization of people aged 65+.
- 1 in 3 adults in that age group falls each year.
- Of those, 20-30% suffer moderate-to-severe injury that reduces independence and mobility and increases risk of an early death.
- 12-month risk of mortality after being hospitalized for a fall is 50%.

Implications of Falls

- Falling without serious injury increases the risk of skilled nursing facility placement 3-fold. With serious injury it is 10-fold!
- Many people who fall, even those who are not injured, develop a fear of falling. This may cause them to limit their activities, leading to reduced mobility and physical fitness.
- Systematic review by Tinetti and Kumar showed the strongest risk factors for falling include previous falls as well as strength, gait and balance impairments.
- Majority of falls occur during walking, specifically during dual-task situations
- Medicare spends over \$70mil/yr for fractures d/t falls in WA state alone

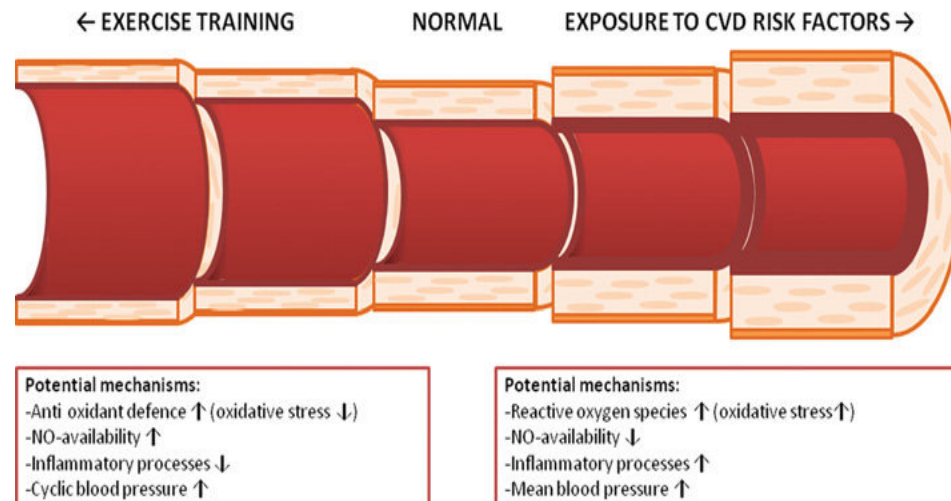


Physiological Changes as We Age

Vascular Effects

- Age-related oxidative stress promotes inflammation in endothelial cells and decreased nitric oxide availability
 - Oxidative stress= imbalance in cells and tissues between free radicals and antioxidants that detoxify these reactive products
- Endothelial cells line all blood vessels
- Inflammation in endothelial cells leads to increased stiffness of large arteries, increased arterial wall thickness, and peripheral vasoconstriction.
- Increased vascular resistance, increased blood pressure
- **Our predictive cardiac testing can assess and detect inflammation in endothelial lining and provide risk of cardiac event in next 5 years**

Vascular Resistance



Cardiac Effects

- Aging leads to myocyte enlargement and fibrosis of collagen in the heart.
- As the heart wall thickens the amount of blood the chamber can hold may decrease and fill slower.
- Valves of the heart that control blood flow thicken and become stiffer.
- Heart is working harder

Blood Effects

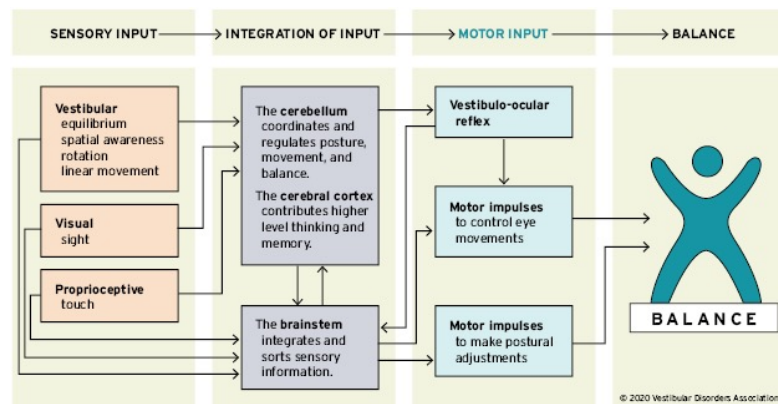
- The blood itself changes slightly with aging.
- Blood volume decrease as total body water decreases with age
- Red blood cell production is reduced in response to stress or illness.
- This means there is a slower response to blood loss and anemia
- Some decrease in WBC and ability to fight off bacteria and resist infection

Muscle Effects

- Muscle strength and mass plays a significant role in the ability to function daily.
- By mid-50s muscle loss (sarcopenia) accelerates to about 10% of muscle mass reduction per decade.
- Loss of muscle tissue is accompanied by an increase in fat tissue
- Decreased muscle mass, strength, and power = falls + decreased independence (quality of life, longevity, etc)

Balance Systems

- Maintaining balance depends on information received by the brain from three peripheral sources: eyes, muscles and joints, and vestibular organs. All three of these information sources send signals to the brain in the form of nerve impulses from special nerve endings called sensory receptors.
- Impairments in any system can cause balance impairment and thus increase fall risk



Effects of Exercise

- Ok so that was a lot of negative material. So what are we supposed to do about this?
- A regular exercise/physical activity routine can slow, and in some cases and to some degree, **reverse aging processes**.
- Healthy aging → Quality of life!

Vascular Effects

- Exercise decreases aorta stiffness and increases aorta compliance.
- Exercise induces pulsatile continuous blood flow which signals endothelial cell survival and activates endothelial nitric oxide synthase. (improves oxygen exchange)
- Cells residing in bone marrow that help generate endothelial cells are mobilized via exercise
- Increases muscle capillary density.
- In other words, it prevents arteries from thickening and promotes exchange of blood.
- Reduces the workload placed on the heart and CV system

Cardiac Effects

- Exercise promotes antioxidant protection in the heart muscle.
- Prevents against ischemic damage and cellular death in the heart
- Prevents thickening of the heart and prevents ventricular dysfunction
- Regular exercise helps the heart maintain its ability to fill and pump blood.

Other Physiological Effects

- Improved glucose management
- Improved sleep
- Increases muscle and tendon strength
- **Can increase speed and power as we age!!!**
- Stimulates red blood cells and helps with oxygen exchange

Psychological Benefits

- Reduces stress and anxiety
- Relaxation
- Enhances mood state
- Improves cognitive function and prevents cognitive decline. Can help prevent conditions like Alzheimer's
- Improves skill acquisition
- May allow you to continue hobbies you enjoy or take up new ones.
- **All these improvements can lead to gaining a sense of control over your health, what you do in your day-to-day life, and increase involvement in social and cultural activities**

How much exercise and What kind?

- Best general recommendation is at least 30 minutes of moderate-intensity physical activity on most, if not all, days of the week
- For structured exercise programs, research indicates best results from 3-5 times per week, 30-45 minutes, at a level vigorous enough to raise your heart rate to ~70% of HR max.
- Resistance training helps build muscle strength, can build muscle mass in aging adults
- Resistance training also improves aerobic capacity (and CV health)
- Resistance training improves bone mineral density and increases resiliency

Assessments and Outcome Measures

- When we begin a program, we must perform a comprehensive initial assessment.
- Our assessments are all aimed at identifying deficits, setting goals, and developing individual wellness plans
- We assess all balance systems with a clinical subjective balance assessment performed by a physical therapist. As needed, we can perform individual gait analysis
- Measure all aspects of fitness including strength, endurance, mobility, and power
- Cardiac Health assessment via blood work
- COVID resiliency assessment via blood work

LTA Research Projects

- LTA Healthcare Partners is working to develop new clinical guidelines for fitness and balance assessments for older adults.
- Implemented amongst larger groups across wide age range and correlated to gold standard.
- Data gathered over 1-2 years to show efficacy of fall reductions at LTA facilities.
- Partnering with university research teams and doctorate programs to gather and publish data.
- Working with neuropsychologists to demonstrate cognitive improvements in our memory care patients

Strength and Power Training



Mechanics,
power,
balance,
strength



Next Presentation

- Learn more about how we measure and improve strength, power, and balance.
- We will also cover exercise adherence and maintenance and setting realistic goals based on age and current fitness levels.
- Results we have seen over the last year
- Details on current areas of research



Training for Life

Dr. Zach Rynders, PT, DPT



Memory Care - Day 1



January 6, 2022



Warm Up • 3 Exercises • Cool Down



WARM UP



senior seated warm up circuit #1

Instructions

- 1 min alternating reach backs
- 1 min seated single arm alternating overhead reach + side bend
- 1 min marching + kickout
- 1 min seated lateral hurdle step over



EXERCISES



Workouts

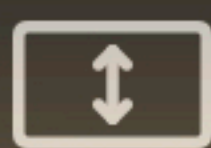
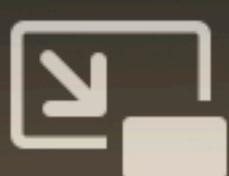


Messages



Account

9:11



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CIRCUIT

B



Circuit 2



med ball side to side seated rotation

Instructions

- 1 min med ball side to side isometric hold (rotate med ball to the side, hold for 5 sec, then switch sides)
- 1 min vertical wood chop (Seated. just trying to add some speed to their movement)

Add results for B

Exercise history



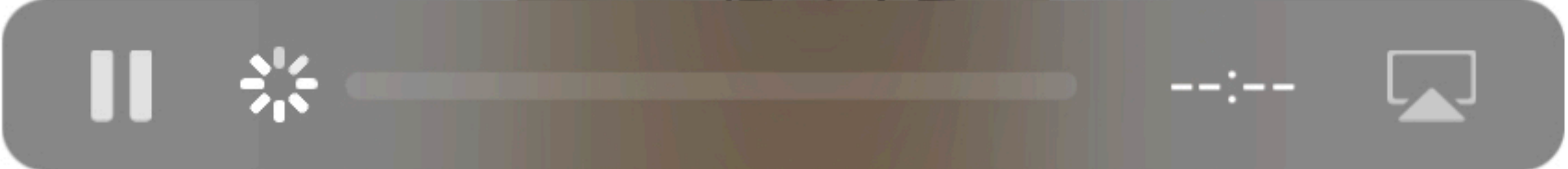


CIRCUIT

B



Circuit 2



seated vertical wood chops

Instructions

1 min med ball side to side isometric hold (rotate med ball to the side, hold for 5 sec, then switch sides)
1 min vertical wood chop (Seated. just trying to add some speed to their movement)

Add results for B

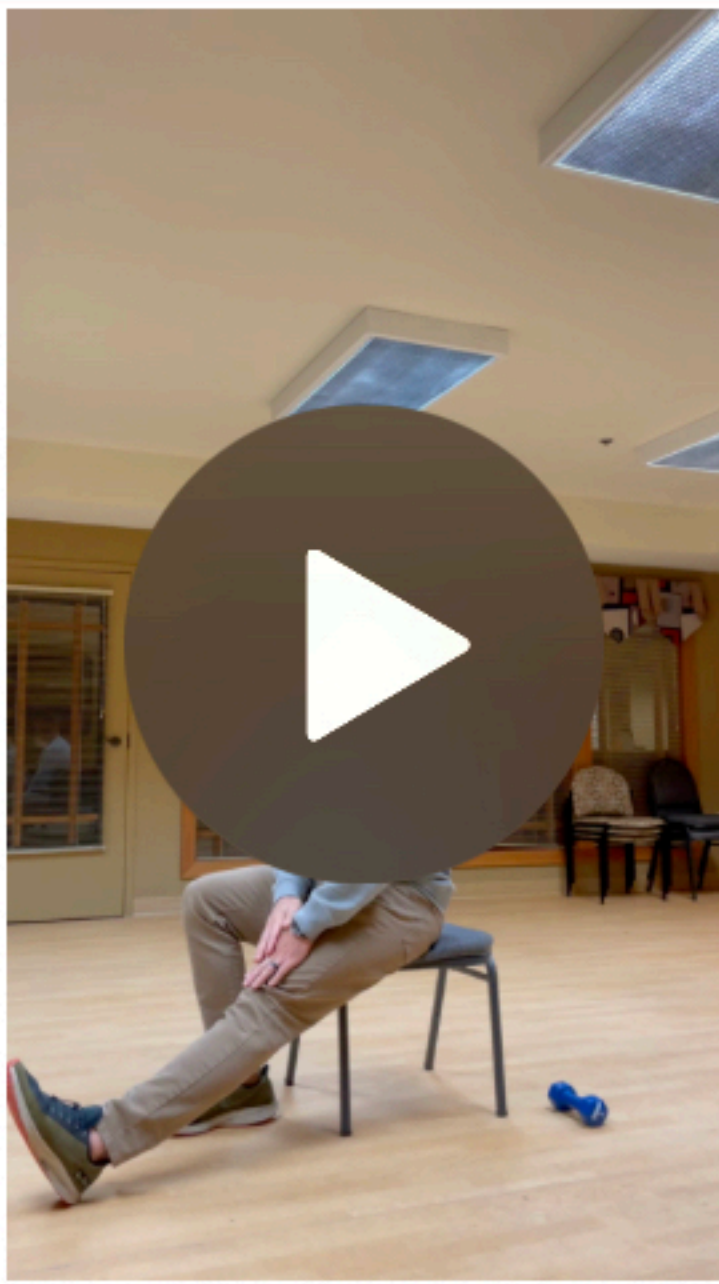
Exercise history



Add results for C

Exercise history

COOL DOWN



seated hamstring stretch

Instructions

hamstring stretch
alternating single arm reach backs + hold

✓ Complete Workout

Coach Zach Rynders

Hi Zach, I have a resident with a contracture of her left hand. What can she safely do in today's upcoming workout?

Today, 9:19 AM



Hi Laramie, below is a link to our youtube video on safe modifications for contractures in the upper extremity. I would like to set up a quick call with you to assess this resident's safety and review medical records. I can provide specific recommendations for this individual resident. What is your availability?

Today, 9:22 AM



Add Message



Workouts



Messages



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