

The Ageless Athlete

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Franciscan HEALTH
SPORTS MEDICINE

Roadmap

- Part I: The Biology of Aging (The Why)
- Part II: The Engineering Approach (The How)
- Part III: Building the Engine & Armor (Training protocols)
- Part IV: Longevity Maintenance (The Long Game)

Introduction

- Aging → Anyone over 22 years old
- Master Athlete > 35 years old
- 20% of the US will be Seniors (65+) by 2030
- Life Expectancy ~80 years (M – 78, F – 82)
- US is less healthy than peer countries



The New York Times Aug. 18, 2009

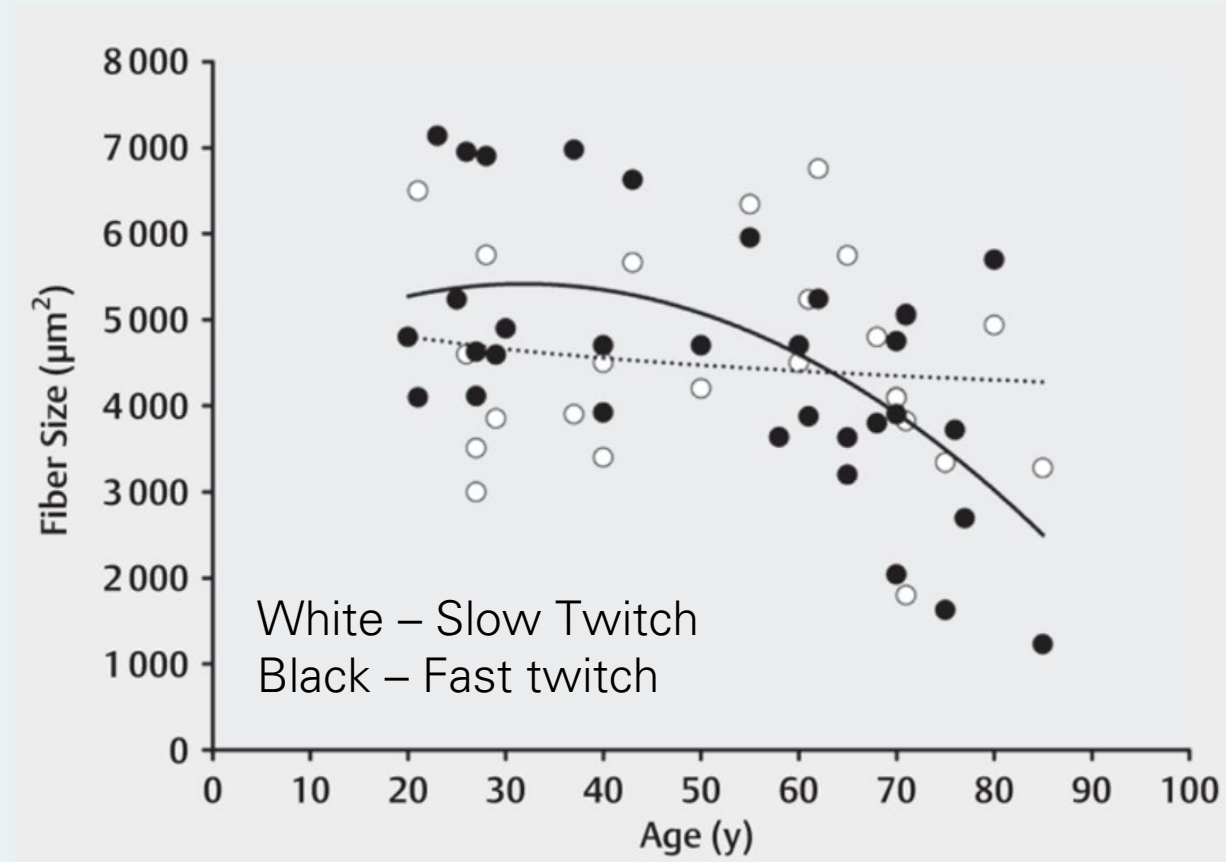
The “ 5/2 Split” Reality

The Sedentary Trap

- 120 hours of sitting – Shortens hip flexors and deactivates glutes
- The Cold Start – Trying to be a hero on the weekend leads to injury
- Mental Mismatch: 20-year-old ambition in a 45-year-old sedentary frame

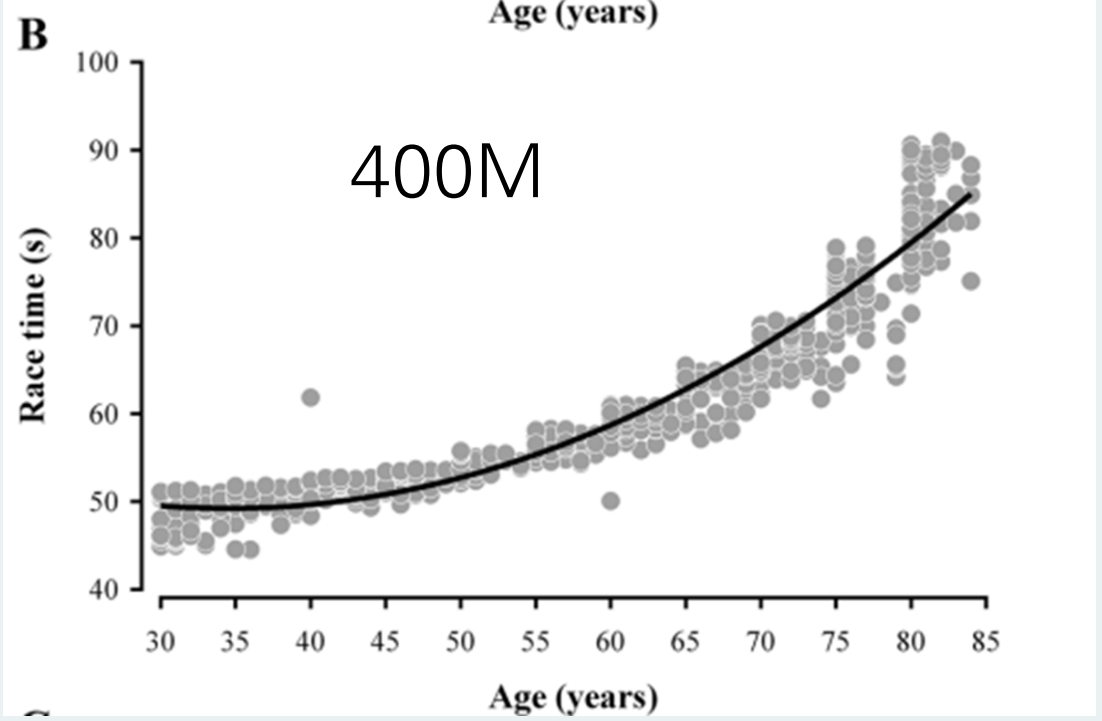
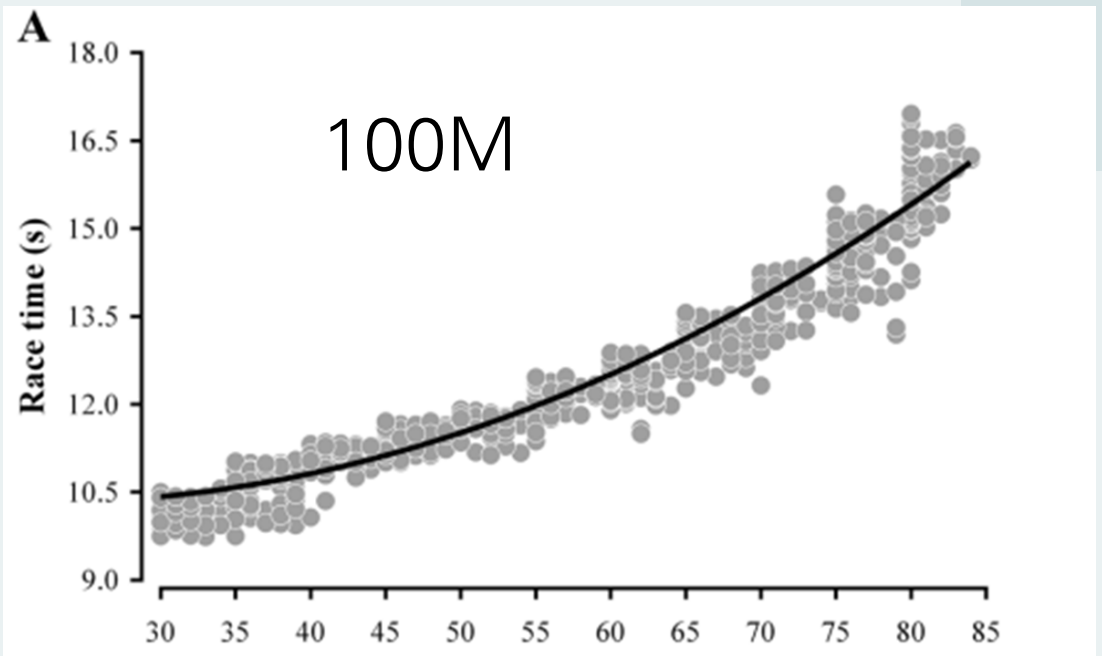
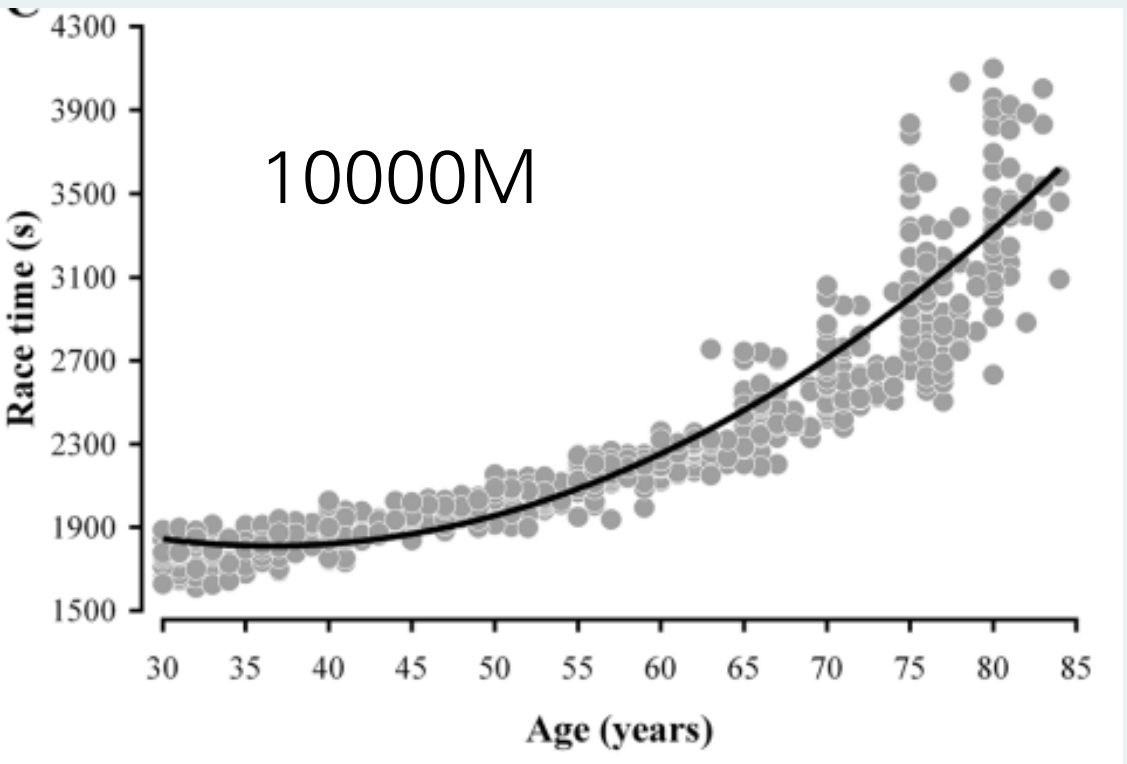
Biology – Sarcopenia

- 50-80 years old will lose 1/3rd of their muscle
 - Men 1%, Female 0.65% per year
- Fast muscle fibers
- Power > Endurance



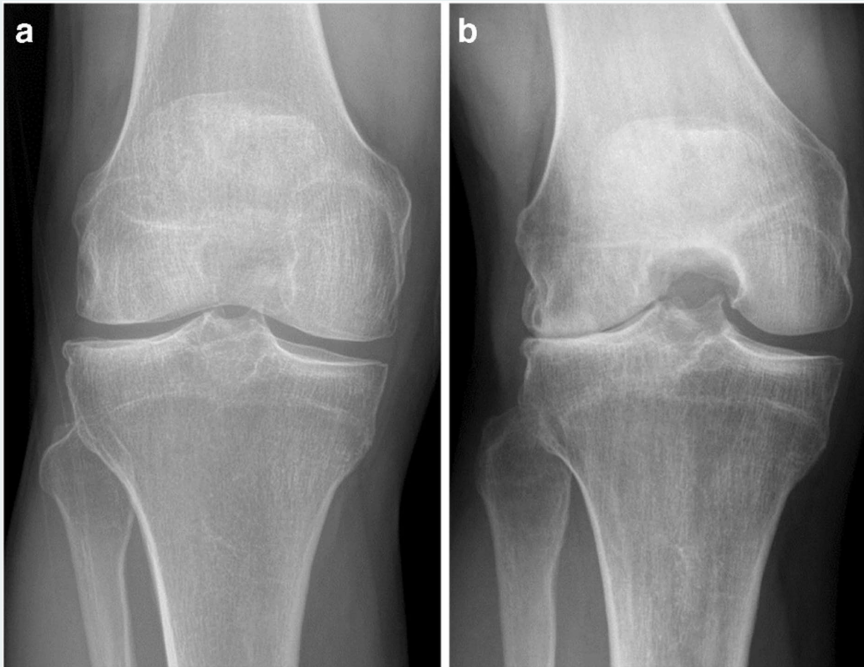
Age-related decrease in performance of male masters athletes in sprint, sprint–endurance, and endurance events

Sport Sciences for Health (2020) 16:385–392

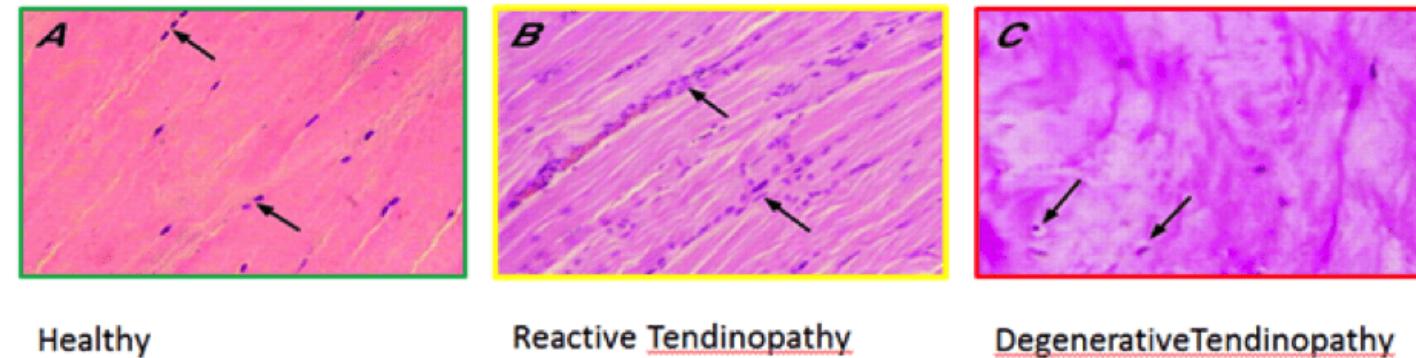


Tendons & Joints

- Tendon Stiffening: Collagen turnover slows → Stiff rope vs Spring
- Hydration loss: Cartilage loses water content → Osteoarthritis
- The Biology Budget: Slower cellular repair → 48-72h longer to clear



A 58-year-old male patient presenting with 7 years of knee pain. Non-weight-bearing (a) and weight-bearing (b) posteroanterior knee radiographs taken 1 month apart. Note the significant difference in the appearance of the lateral tibiofemoral cartilage space



Healthy

Reactive Tendinopathy

Degenerative Tendinopathy

The New Trinity of Longevity



VO2 Max : The engine that powers your lifespan



Strength: The armor that protects your structural integrity



Social Integration: The fuel that sustains your commitment



Goal: Expanding your health to match your Lifespan

What is VO2 Max?

- The maximum amount of oxygen your body can absorb, transport and use during intense exercise/activities
- Most accurate in a lab setting
- Wearables use personal data, heartrate variability, GPS to predict

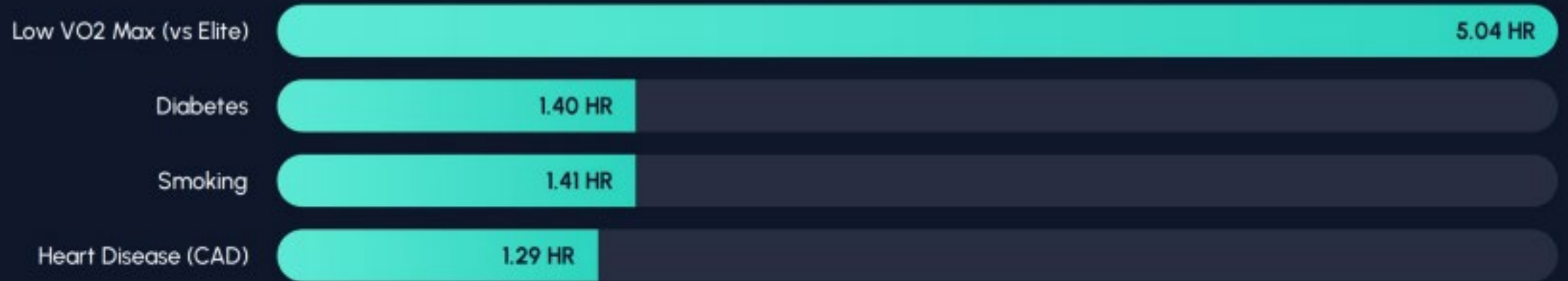


<https://www.healthline.com/health/fitness/vo2-max-test>

VO2 Max: The Ultimate Predictor

- Widely considered the most powerful objective indicator of lifespan
- JAMA 2018 – Cleveland Clinic
- Coronary artery disease, smoking, diabetes and high blood pressure
- Moving from bottom 25% to top 25% reduces mortality risk by 5 times
- Creates a **functional reserve**
 - Less shortness of breath(dyspnea) in COPD patients

MORTALITY RISK COMPARISON



Source: JAMA Network Open 2018 (Cleveland Clinic Analysis of 122,007 patients)

VO2 Max

- It is trainable!
- No plateau or upper limit from mortality benefit
- Most science backed protocol: The Norwegian 4 x 4
 - 10 minute warm up
 - Four 4-minute intervals at 85-95% max heart rate
 - Rest for 3 minutes between at 70% max heart rate
 - 3 times a week

THE TUNE-UP: CARDIAC SAFETY

Age Bracket	Primary Concern	Screening Focus
Under 35	Structural: HCM (Hypertrophic Cardiomyopathy)	EKG, Family History, Echo
Over 35	Ischemic: CAD (Plaque/Coronary Events)	Stress Testing, Calcium Scoring, Lipid Profile
The "Red Line"	STOP IMMEDIATELY: Chest pain, fainting, or sudden dyspnea.	Immediate Clinical Evaluation

Strength Training: Building the Armor

Joint Protection: Muscles act as the primary shock absorbers



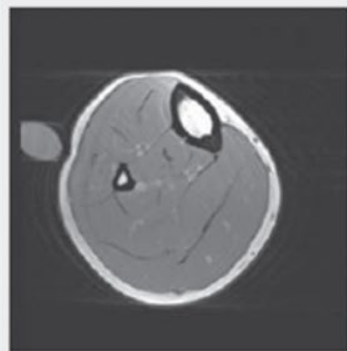
Metabolic Sink: Muscles clear blood sugars and improve insulin sensitivity



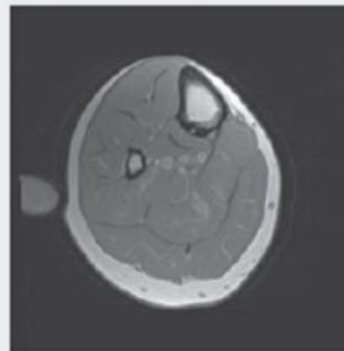
Bone Health: Primary defense against bone loss

Sarcopenia Antidote

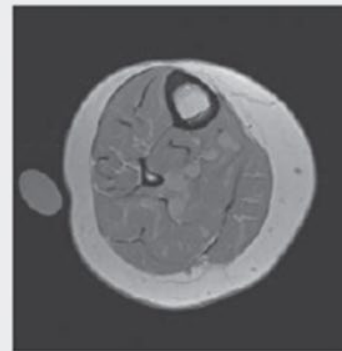
- Progressive Resistance Training
- Capillaries preserved with lifelong exercise
- Chronic exercise leads to ~50% greater quad size in 70s compared to age matched controls (Chambers et al)




Young Exercising Women



Lifelong Exercising Women



Old Healthy Women

 **The American Heart Association Recommendations for Physical Activity in Adults**

For Overall Cardiovascular Health:

At least **30** minutes of moderate-intensity aerobic activity **At least 5 days** per week for a total of **150** minutes

OR

At least **25** minutes of vigorous aerobic activity **At least 3 days** per week for a total of **75** minutes

or a combination of the two

AND

Moderate **HIGH INTENSITY** muscle-strengthening activity **At least 2 days** per week for additional health benefits

For Lowering Blood Pressure and Cholesterol:

An average of **40** minutes of moderate-to-vigorous-intensity aerobic activity **3-4 days** per week

© 2014 Learn more at heart.org/ActivityRecommendations.

The 'Core Four' Movements

- **Squat:** Foundation for mobility and stairs
- **Hinge:** Glute/hamstring power to protect the back
- **Push:** Upper body and shoulder stability
- **Pull:** Counter 'desk hunch' or 'tech neck'

LIFTMOR trial

Postmenopausal women > 58 years old with osteopenia

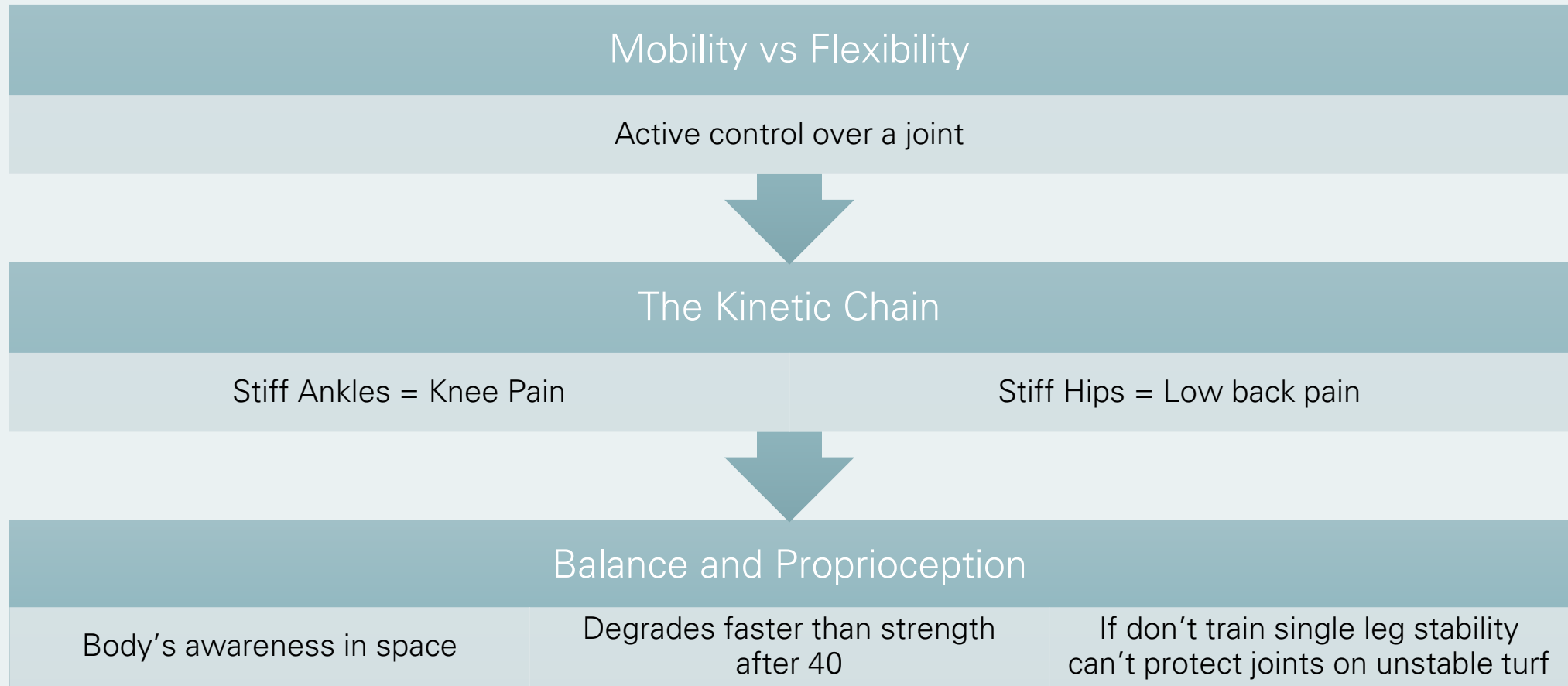
Twice a week: 5 sets of 5 reps of deadlifts, squats, overhead presses and jumping pull-ups

- 85% of 1-rep max

Builds not only muscles but reverses bone loss

Low intensity exercise allowed bone loss to continue

Injury Risk?



Social Integration: The Longevity Multiplier

- **Isolation Risk:** Just as damaging to health as smoking
 - Isolation is more dangerous than obese and physically inactive
- **Neural Agility:** Interactive Sports protect brain health via cognitive
- **Consistency:** Community is the #1 predictor of 12-month training adherence

Social Integration

Loma Linda, California
-Only Blue Zone in the USA

- **The Habit:** Strict vegetarian diet, no smoking, and regular, low-impact exercise.
- **The Edge:** A weekly 24-hour Sabbath dedicated entirely to family, nature, and rest.
- **The Data:** Residents live up to **10 years longer** than the average American

Roseto, Pennsylvania
-"Americanized" by 1980s

- **The Habit:** High-fat diet, regular smoking, and demanding physical labor.
- **The Edge:** Intense multi-generational social integration and zero social isolation.
- **The Data:** Heart disease deaths were **nearly non-existent** despite poor health habits

What is your “Why”?

- To stay competitive in local leagues or races?
- To keep pace with children or grandchildren?
- To wake up without chronic joint or back pain?
- To maintain independence and mobility into the 8th and 9th decades?

THE LONG GAME

VO2 MAX is your engine.

STRENGTH is your armor.

SOCIAL CONNECTION is your fuel.

CONSISTENCY is the only "secret" that works.

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Thank you!