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Masters and the Aging Athlete



Objectives

- Define Masters
 - Different sports
- Aging Athlete
 - Strength: Sinclair-Meltzer Equation
 - Speed:
 - Proprioception:
 - Flexibility:
 - Cognitive
- Chronic medical issues
- Special Considerations





What is a Master?

- Recent 200 meter World Record!

Masters Athlete

- People at least over 35 y/o
- Should participate in aerobic and resistance exercise
- Arthritis and joint replacement are not contraindications
- Regular training regimens to maximize potential
- Senior games over 2500 athletes
- New York City marathon over 100% increase in athletes over 50 in past 10 years

Sports & Age in which become Masters

- Swimming 25yo
- Weightlifting 35yo
- Powerlifting 40yo
- Gymnastics 20yo



Oldest swimming competitor, 98-year-old Margo Bates, is helped from the water after competing in the 100m backstroke at the Sydney 2009 World Masters Games

Masters are gaining on Non-Masters!!

- According to Dr. Akkari et al, they noticed that number of world records in many sports like track & field has “stagnated” over the past 3 decades. For example very little improvement in 100m and 400m time. Now, when you compare to number of world records achieved by Masters athletes in same sports, much more productive.
- Conclusion: While younger athletes' performance has stagnated, Masters athletes improved their athletic performance significantly and progressively over the years. The magnitude of improvements was greater in older age groups gradually closing the gap in athletic performance between younger and older participants.

Akkari A, et al, “Greater progression of athletic performance in older Masters athletes,” Age Ageing. 2015 Jul;44(4):683-6.

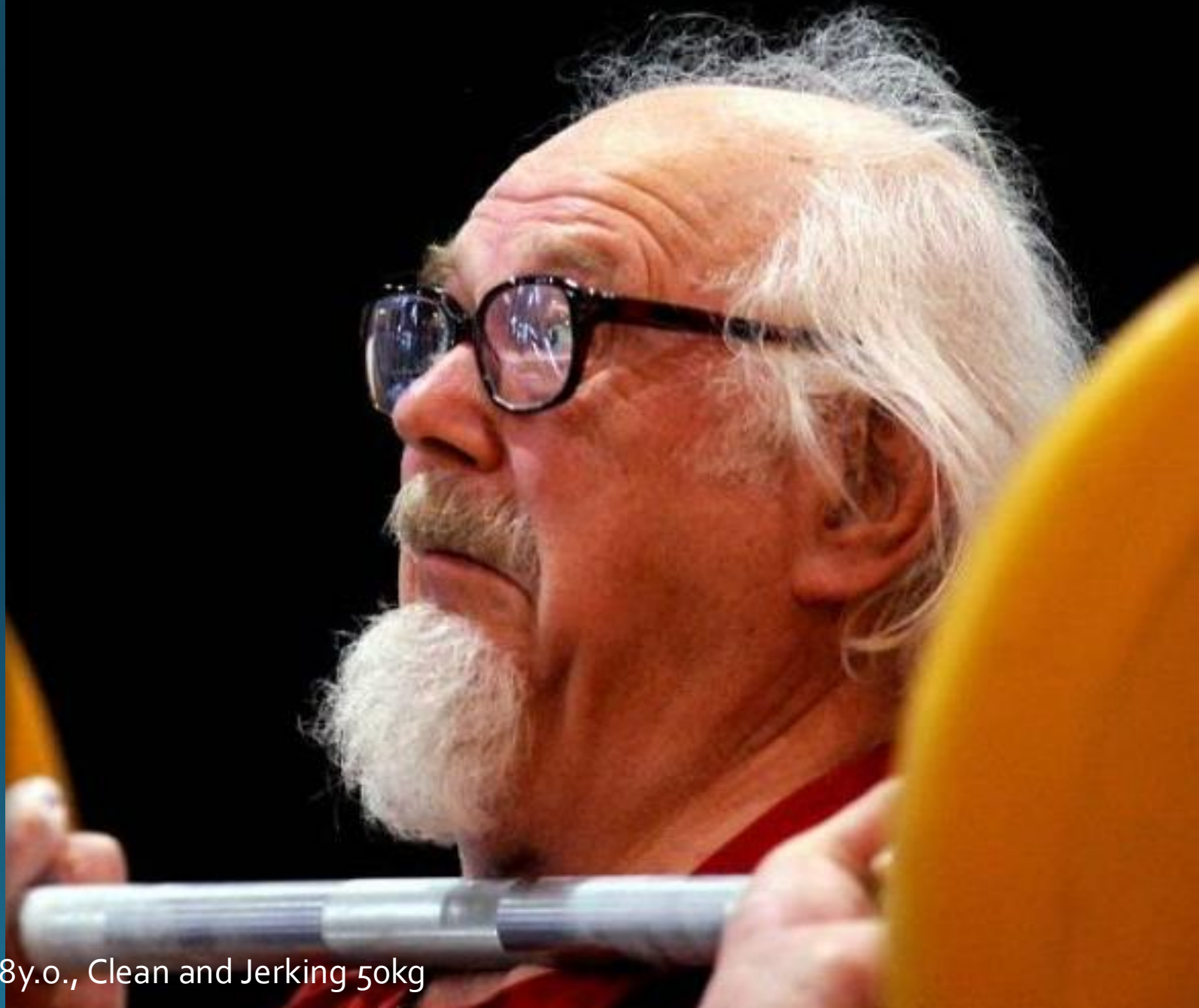
Aging Athlete : STRENGTH

- **Sinclair-Meltzer Equation:**
Calculates linear strength decline as we age
- We lose strength with age – sarcopenia (atrophy and decrease in fibers)
 - Try to maintain
 - Happens in late 30s
 - Smaller declines if active



Aging Athlete : STRENGTH

- IWF Masters: Kurt Rosenberger C&J 50kg at 86y.o.



Kurt Rosenberger, age 88y.o., Clean and Jerking 50kg

Speed

- Continuing to train keeps our speed losses minimized
- If previously not active can actually increase speed
- The more speed we keep the better we do with age!



Aging Athlete: SPEED



- Longevity study looking at **SPEED of AMBULATION** is the SINGLE MOST IMPORTANT PREDICTIVE FACTOR in high quality longevity in OCTAGENERIANS.



Aging Athlete: SPEED

- Australia's Osmo Millridge, 77, takes on the water jump during the Men's steeplechase for 70+ year-olds during the World Masters Games in Sydney on October 10, 2009.

Aging Athlete: PROPRIOCEPTION

- Dorothy De-Low aged 99 has enough balance to compete at 2009 World Masters Games in Sydney, AUS



Aging Athlete: PROPRIOCEPTION

- Improved proprioception has been shown to decrease risk of Falls in Masters athletes
- Hip Fractures one of the LEADING causes of death /disability in Masters
- Sports like Pilates, Yoga, Tai-Chi, Water Aerobics have ALL been shown to help improve balance and decrease risk of falls.

Aging Athlete: FLEXIBILITY

- Olga Kotelko, 90, leaps in the 70+ women's long jump at the Sydney Olympic Park Athletic Centre during the Sydney 2009 World Masters Games on October 16, 2009



Aging Athlete: FLEXIBILITY



- Static vs. Dynamic stretching on a daily basis
- Exercises like Yoga and Pilates very helpful in achieving better flexibility

Aging Athlete: COGNITION



Age-Related “forgetfulness”
is NOT Dementia



Dementia is NOT necessarily
a Contra-Indication to all
sports



Studies show that mental
exercises in those over 50y.o.

Decrease rate of Depression
Improve social engagement
Improve scores on MME and other
cognitive testing



Visit www.Brainworks.com
for more info on mental
exercises to stimulate the
aging brain

Chronic Medical Conditions

- Cardiac
- HTN
- CVA/thrombosis
- Obesity
- DM
- Arthritis
- Osteoporosis
- Vision issues (glaucoma, cataract, poor vision)

Pre participation

General evaluation

Look at vision

Diabetes risk

Hypertension

May need lab work

EKG?

- ACSM Exercise Recommendations:
 - 30 min of mod intensity exercise 5 days a week
 - 20 min of vigorous aerobic 3 days per week
 - Balance/Proprio 2 days a week
- Group based exercise helpful in Masters!!

Cardiac Considerations in Masters

Coronary Artery Disease	
Atrial Fibrillation	If rate controlled, can participate in most sports
Arrhythmias	Control and monitor
Myocardial infarction	Treadmill stress testing helpful in grading fxnal ability post-MI
Aortic Stenosis	Gradient > xx mmHg, high dynamic sports CONTRAINDICATED
Bicuspid Aortic valve	Dilatation of Aortic Root > 4.4cm, high dynamic sports CONTRAINDICATED 36 th Bethesda Guidelines



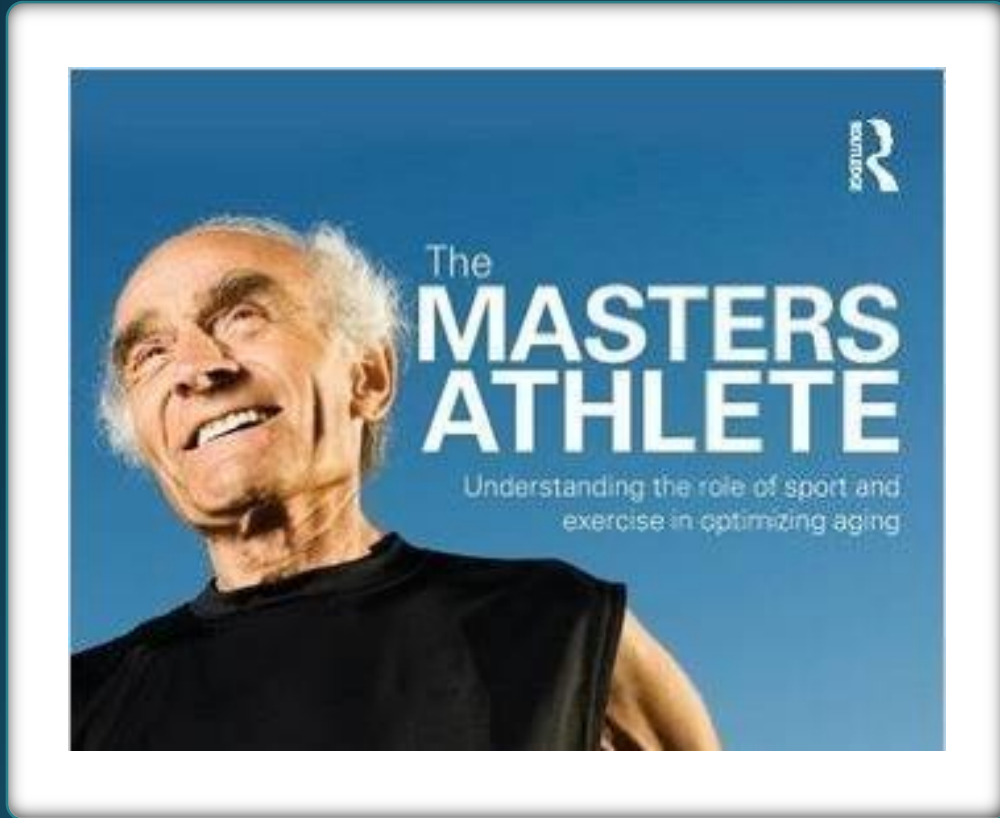
Implantable Defibrillator

Cardiac Considerations in Masters

- Shapero K, Baggish A et al looked at 591 masters runners in the Boston area as part of MASTERS (Masters Athlete Survey To Evaluate Risk)
- Conclusion: Among MAs, CAD can be decreased and is associated with typical risk factors including dyslipidemia and prior tobacco use. These findings suggest that there are numerous opportunities to improve disease prevention and clinical care in this population.

Shapero K et al, "Cardiovascular Risk and Disease Among Masters Endurance Athletes: Insights from the Boston MASTER (Masters Athletes Survey To Evaluate Risk) Initiative," Sports Med Open. 2016 Dec;2(1):29.

Hypertension in Masters



- Bethesda Guidelines states:
- JNC recommendations:
- Control BP
 - Diet & exercise, if possible
 - Consider ACEI, ARBs
 - Careful with
 - Betablockers – syncope
 - Diuretics- dehydration, hypokalemia

Vascular issues in Masters



- Cerebral Vascular Accident
 - Thrombosis (i.e. DVT)
 - Carotid Disease
 - Aortic Aneurysm
-
- Bethesda Guidelines – good reference

Diabetes Mellitus in Masters



- Same issues as other Diabetic athletes
- Sometimes difficult when initiating new activity levels
- Must make sure to educate and test for end organ issues
- Fall risk
- Don't control BS too tight!

Osteoporosis in Masters

HEALTH MAINTENANCE

- Monitor Vitamin D levels
- Check Calcium intake
- Encourage resistance training
- Get DEXA scanning after Menopause

TREATMENT

- Improve nutrition
- Supplement Vitamin D, Calcium
- Increase resistance training
- Calcitonin
- Bisphosphonates (non child bearing)



Australian Women's 100M Relay Team WMG (65+ age group)

Practice Recommendation – EBM

Screening for Osteoporosis

USPSTF

- Women $\geq$ 65 yrs be screened routinely. SOR: B
- Women younger than 65 whose risk is equivalent to 65 yr old woman be screened with one or more risk factors SOR: B

<http://www.uspreventiveservicestaskforce.org/uspstf10/osteoporosis/osteors.htm>

Secondary Causes of Osteoporosis

DRUGS	Chronic Disease	Nutritional	Endocrine
Glucocorticoids GnRH agonists Medroxyprogester PPIs TZDs Aromatase Inhib Phenytoin SSRIs Phenobarb Lithium Thyroid excess Heparin	RA Myeloma/Ca COPD RTA Transplantation Mastocytosis Thalassemia Immobilization HIV	Vit D Deficiency Malabsorption Hypercalcuria Ca++ Deficiency Alcoholism Bariatric Surgery Chronic Liver Dz Malnutrition High Homocysteine	Type1 DM Hypogonadism Hyperparathyroid Cushing Thyrotoxicosis Acromegaly Anorexia Nervosa Hyperprolactinemia Porphyria Hypophosphatasia

Non-Pharmacologic TREATMENT

- **Resistance & weight bearing exercise** – improves microarchitecture
- **Reduce Fall Risk**
 - Balance exercise decreases falls – tai chi, yoga
 - Remove home hazards
 - Vitamin D 800 units daily
 - Remove hazardous meds.
 - Eliminate alcohol – increase falls
- **Stop tobacco** – decreases BMD.
- **Calcium and Vitamin D** – small reduction in fracture in meta-analysis



Nutrition

- Huge in our Master's population
- Increased protein need to maintain muscle mass
- HYDRATION!
 - A huge concern
 - Endurance Master's athletes
 - Thirst diminishes with age, need to push hydration (with caution)

Visual changes in Masters



- Cataracts
- Glaucoma
- Retinal detachment
- Presbyopia (Near-Sighted)
- Myopia (Far-Sighted)
- Macular Degeneration (Wet or Dry)
- Diabetic Retinopathy
- Blindness

Special Considerations

Adaptions for particular sport

Adjust goal-Setting

Partner with athlete/ Engage them in decision process

Medication review/
contraindications

Sporting Career Ending
injuries – discussions

Mental Health issues

- Not like high school or college athletes.



52yo World Record Holder in High Jump 2009 WMG

Mental Health

- A huge issue for all ages!!
- Vital in Masters Athletes
- Isolation
- Motivation
- Dealing with decreased ability
- Need support systems





Final Thoughts on Masters Athletes

- Never assume they are NOT as competitive as younger athletes.
- Try to figure a way to keep them in their sport.
- Treat them with respect regardless of age and ability.
 - They were once YOUNG and may be ex-Olympians, ex-professionals.
- Be mindful with medications you prescribe.
- Keep all athletes going!!!
- Exercise truly is medicine.....



Thank You!!