Prevention and Treatment of Common Injuries in the Aging Athlete

M. Sue Guyer

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Disclosure

- I M. Susan Guyer, speaking at the 32nd Fall symposium at the New Hampshire Musculoskeletal Institute have:
  - no relevant financial relationship to disclose

  and
  - will not discuss off label use or investigations used in my presentation.

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Objectives

- 1.Analyze risk factors contributing to injury in aging athletes.
- 2. Design evidence-based prevention programs tailored to older adults.
- 3. Evaluate emerging treatment approaches for common injures in the older population.

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Risk Factors with Aging Athletes

- Decline in cell regeneration
  - Delay is partly due to a decrease n the production of stem cells
- Reduced blood flow to tissues
  - Can decrease by 40%
- Immune system become less efficient
  - Immune cells decrease by 50% by age 70
- Reduced FT fiber activation, increase muscle stiffness, decreased tissue organization, decrease lubrication…

Van der Wal, H. (2023). Sporting Injuries in the Older Population. In: Van den Wyngaert, T., Gnanasegaran, G., Strobel, K. (eds) Clinical Atlas of Bone SPECT/CT. Springer, Cham. https://doi.org/10.1007/978-3-030-32256-4_132-1

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Case Study

- A 62 year old competitive female athlete comes to you with a 10 month hx of medial epicondyle pain. She has been dx'ed by the physician with Medial Tendinopathy and the script states to evaluate and treat.

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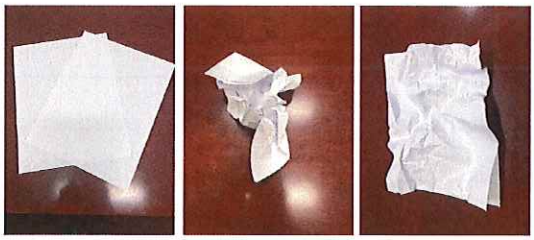
Let's Play



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Injury Cascade

- Injuries and surgery create hormonal and inflammatory stress
  - Triggers rapid muscle lose
- 150-400 grams of muscle mass during the first 2 weeks if immobilized
- Decreases the skeletal calcium and magnesium stores
  - Needed for muscle contraction
- Essential to manipulate diet to minimize muscle loss
  - Adequate daily protein intake .9 to 1.1 grams per pound to slow rate

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Approximate Rate of Tissue Healing

Tissue & Grades of Injury	0-3 d	4-14 d	3-4 wk	5-7 wk	2-3 mo	3-6 mo	6-12 mo	>1 yr
Skin								
SQ								
Fascia								
Muscle								
DOMS (Exercise included)								
Grade 1								
Grade 2								
Grade 3								
Tendon								
Acute								
Subacute								
Chronic								
Rupture/surgical repair								
Ligament (extra-articular)								
Grade 1								
Grade 2								
Grade 3								
Intra articular								
Bone								

Abbreviations: DOMS, delayed onset muscle soreness; SQ, subcutaneous

*Expected time frame for tissue healing after injury. Rate of healing is influenced by the degree of tissue damage (Grade), particularly with muscle, tendon, and ligament injury. Muscle: Grade 1, mild damage (<5% of fibers), minimal loss of strength and function; Grade 2, moderate fiber damage, loss of strength and function; Grade 3, complete rupture of muscle/muscle-tendon and loss of function. Ligament: Grade 1, stretching, tiny/no tear, no joint instability; Grade 2, partial tear, mild instability; Grade 3, complete rupture, loss of function. The shaded cells correspond to the range of healing time for the specific tissue injury indicated in the left column. Healing time varies based on degree of tissue injury.

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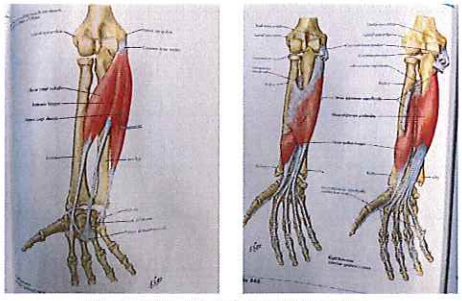

Pictures from Atlas of Human Anatomy 4th Edition, Netter

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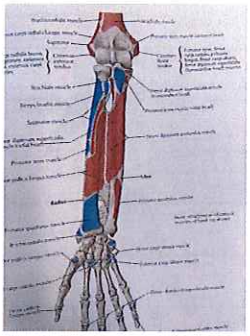

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Treatment

- Yes elbow, but also hand/wrist, shoulder Complex, and core.
- Might have to stimulate the Inflammatory phase.
- Tendons respond to load, stress, eccentrics.

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Now that you're older, you should really take it easy!

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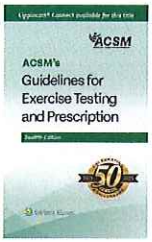
Strength goals are falling short for older athletes!

- Resistance training should begin with low intensity (40-50% of 1 repetition max (RM)) and eventually progress to moderate (60-70% of 1 RM) and then to high intensity (80% of 1 RM) performed 2-3 times per week with a goal of 10-15 repetitions for 2-3 sets.



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Building Muscle as we Age

- Lift heavy (make up for Estrogen stimulating the myosin filaments causing lower power and strength)
  - 1-6 reps
  - 3 sets
  - 3-5 exercises
  - Large rest in between
  - Simulating nervous response to recruit
- Eat 35-40g of protein within 30 minutes of heavy lifting (overcoming the insulin resistant)

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Staples to work into routine

- Squat
- Split squat
- Overhead squat
- Deadlift
- Bench press
- Pendlay Rows

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Bounding

- Squat Jump
- Side hope
- Skipping
- Mountain Climbers
- Speed Skate

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Additionally

- Core and hip muscles should be strengthened to prevent falls.
- Additionally, high speed power training in older adults has been associated with increased speed related performances and may also benefit in fall prevention

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Back to the basics, push the goal

- Know what you are treating… really know.
- Know the phase of the healing process.
- Establish the base of strength and include the kinematic chain. (this can take months to build)
  - And then…
- Go beyond the established criteria with strengthening.

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