ADJUNCT REHAB CONSIDERATIONS FOR THE AGING ATHLETE

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AGENDA

- Examining adjunct joint and biomechanical mobility that can be used advantageously to improve rehabilitation outcomes
- Understanding physiological changes, muscular, tendon and hormonal health implications
- Insights into rehabilitation factors and cardiovascular health goals

IMAGE BY CHRISTIAN PEDERSON/GETTY IMAGES

DISCLOSURES

I have no relevant financial relationships with ineligible companies to disclose.

THE BIOMECHANICAL ADVANTAGE

Lumbar-Hip Complex Adaptations

Lumbar Spinal Stenosis Considerations:

- Increase hip extension for terminal stance
- Increase thoracic extension for overhead activities

Hip OA Considerations:

- Increase lumbar extension mobility for midstance to terminal stance
- Increase calf and talocrural mobility for increased ankle dorsiflexion moment from midstance to toe off

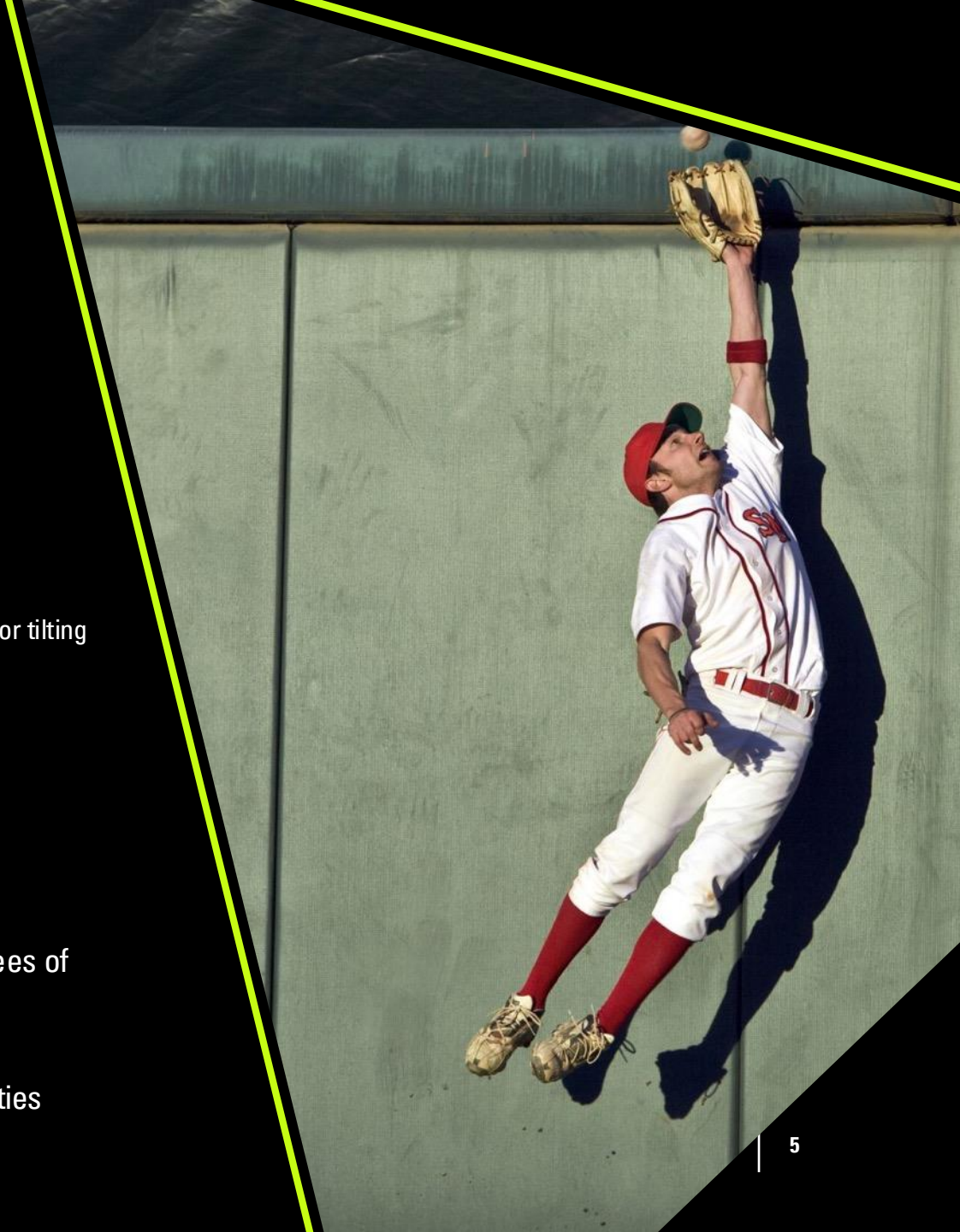
Achilles Tendinopathy Considerations:

- Reduce plantarflexion moment from Midstance to toe off
- Control transverse and frontal loading via proximal strength to load Achilles in a sagittal plane

THE BIOMECHANICAL ADVANTAGE

Scapular-Glenoid Complex Adaptations

- AC Joint Impingement Considerations:
  - Improve thoracic extension/rotation mobility
  - 9-15 degrees of thoracic extension required for scapular upward rotation and posterior tilting
  - Thoracic kyphosis may restrict end ranges of shoulder flexion
- Glenohumeral Painful Arc:
  - Improving upward Scapulothoracic rotation
  - Ensure Acromioclavicular and Sternocostal mobility
  - Improve Thoracic Extension/Rotation Mobility
- Scapulohumeral Rhythm and Scapular Kinesis
  - Ensure 2:1 ratio of glenohumeral to scapulothoracic motion after 30 degrees of shoulder abduction
- Add Serratus Anterior MMT to Clinical Observations
  - Ensure can keep scapula against thoracic wall with weightbearing activities



THE BIOMECHANICAL ADVANTAGE

The Critical Balance of Load Versus Tissue Adaptation

- Load (including rate of application, direction and duration)
- Physiologic process to withstand and have beneficial adaptation
- Bones induced by Wolff's Law become denser and stronger
- Muscles induced by load hypertrophy and increase in size and strength to increase force
- Tendons and ligaments increase resiliency by increased collagen diameter and number.

Increased Rest Between Hard Efforts

Neuromuscular Training Is Essential

- The local stability of joints with small movement patterns

THE BIOMECHANICAL ADVANTAGE

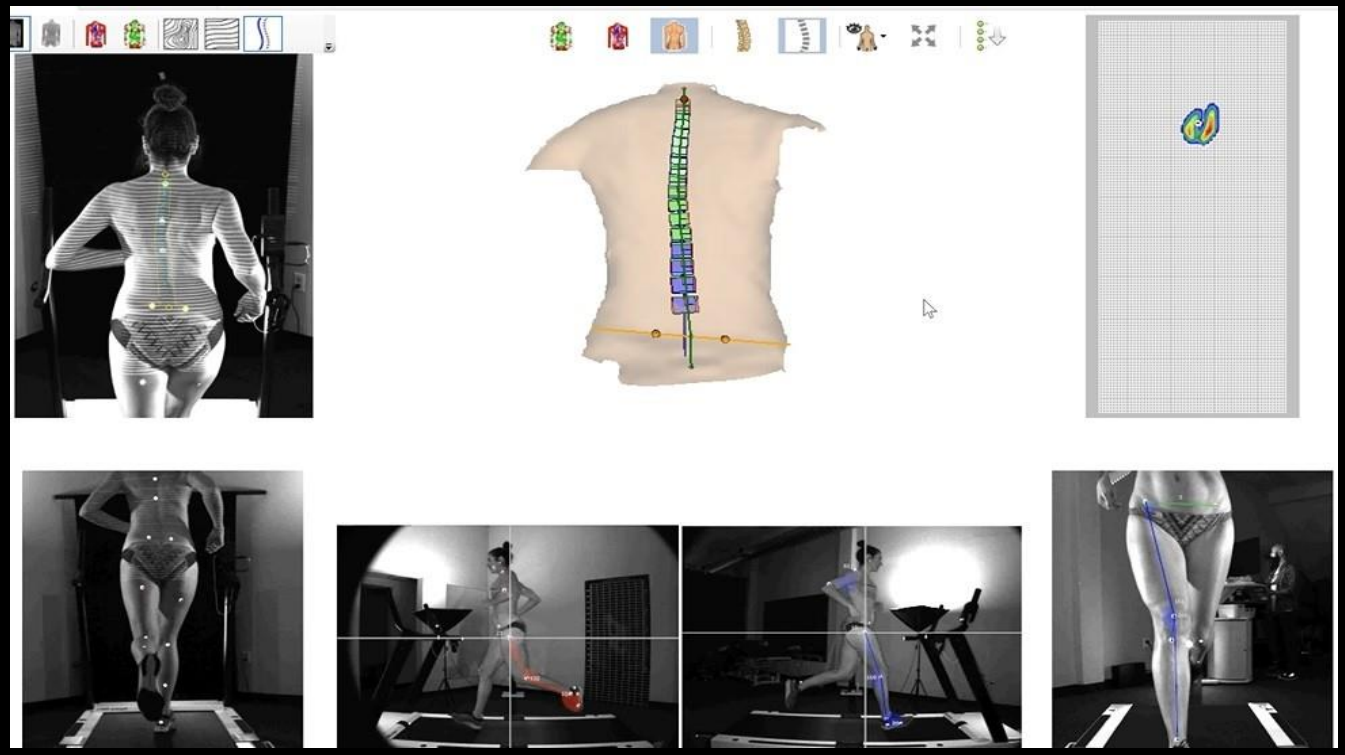
BIOMECHANICAL GAIT CONSIDERATIONS

Increased Risk of Injury with

- Excessive Anterior Lean
- Initial Ground Contact Anterior to the Center of Mass

Change Movement Patterning *Cautiously* in the Presence of Pathology

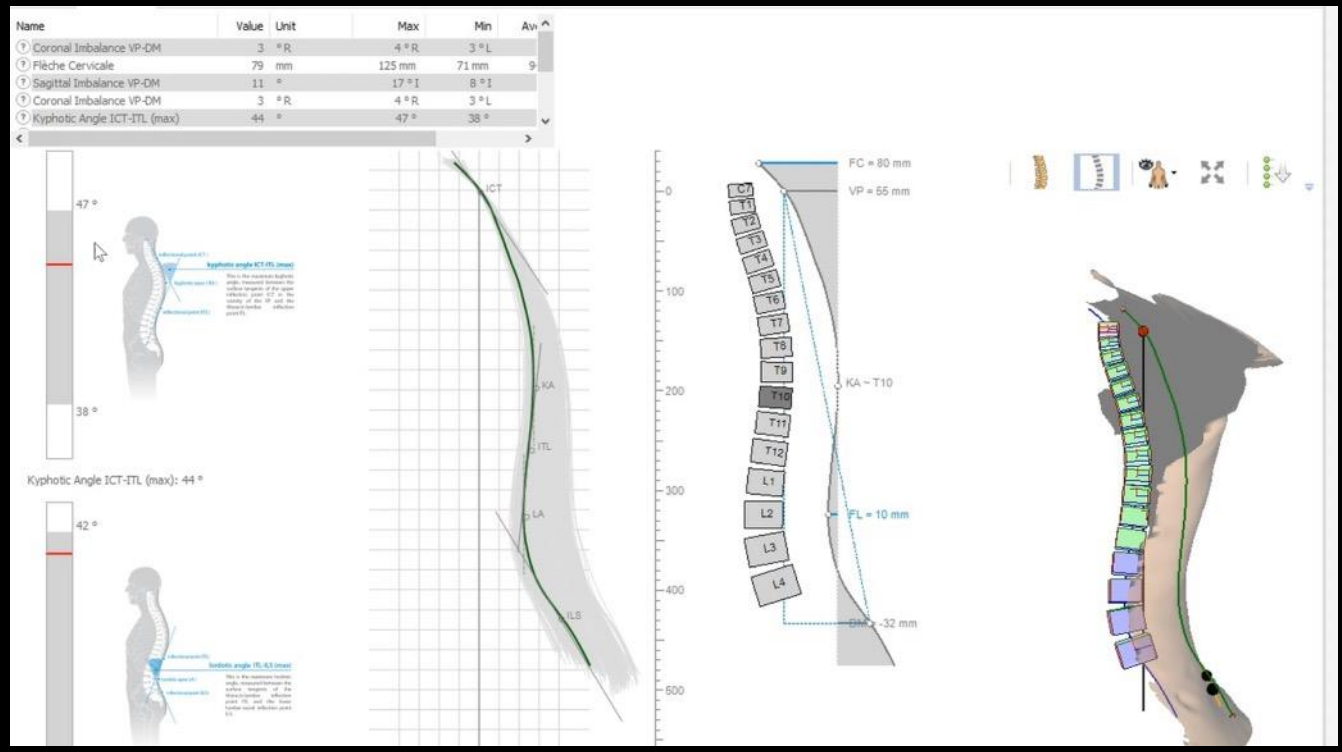
- e.g. Hip Labral Pathologies- allow biomechanical gait asymmetries to exist
- E.g. Squat with retroverted hips versus anteroverted hips



THE BIOMECHANICAL ADVANTAGE

BIOMECHANICAL GAIT CONSIDERATIONS

- Thoracic Spine Distributes Ground Reaction Forces



PHYSIOLOGICAL CHANGES IN AGING ATHLETES

CHANGES IN MUSCLE MASS, HORMONE LEVELS, AND RECOVERY CAPACITY

MUSCLE MASS

Sarcopenia
- Initiates in the 30s
- Declines 3-8% every decade

Less resistant to anabolic stimuli
- Reduced protein synthesis response

Decrease Type II fibers for power/strength and increase Type I fibers

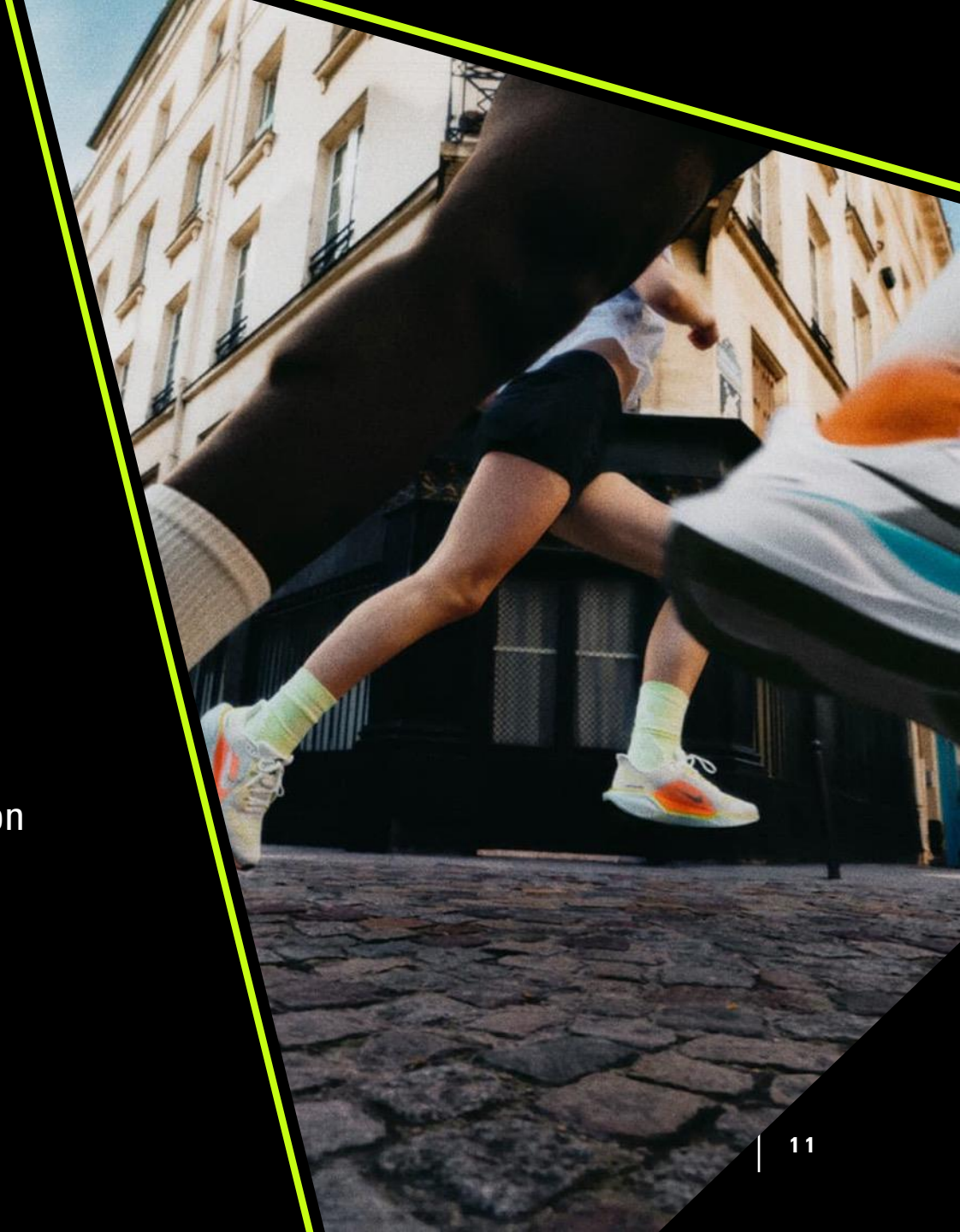
Satellite cell activity reduces
- Repairing muscle and adaptation to exercise reduces

TENDON HEALTH INTEGRITY

More disorganized in the collagen make up

Increased stiffness in the tendon

23.5 percent prevalence of gluteal tendinopathy in female population



ROBUST STRENGTH PROGRAMS

IMPORTANCE OF STRENGTH TRAINING FOR AGING ATHLETES.

CHALLENGING TO COMPLETE ANOTHER SET

FOCUS ON PRE-PERI-POST MENOPAUSE

BONE AND TENDON HEALTH

- **HIGHLY OSTEOGENIC**
  - Basketball
  - Impact aerobics
  - Dancing/gymnastics
  - Tennis
  - Jumping Rope
- **MODERATELY OSTEOGENIC**
  - Running/Jogging
  - Strength training
  - Brisk Hill walking
  - Stair Climbing

“

Sleeping less than 8 hours a night almost doubles injury risk.

MORE TO COME...

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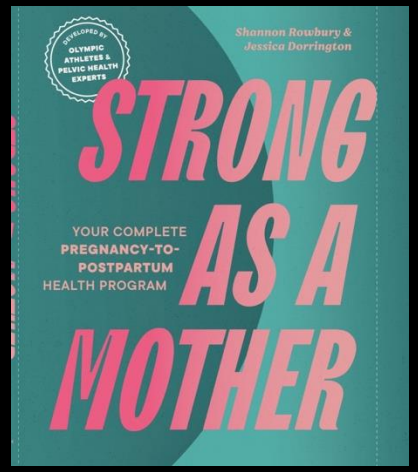
SUMMARY

- IMPORTANCE OF STRENGTH TRAINING FOR AGING ATHLETES.
- INTEGRATE ADJUNCT JOINT SCREENING AND REHABILITATION EXPECTATIONS INTO ORTHOPEDIC PRACTICE.
- IMPLEMENT CHANGES AND ESTABLISH EXPECTED TIMELINES AND REHAB OUTCOMES BASED ON SYSTEMIC FACTORS,
- LOOK FOR BIOMECHANICAL KINETIC CHAIN INFLUENCES TO IMPROVE REHABILITATION OUTCOMES, INCLUDING PROXIMAL JOINTS AND IN TRI-PLANAR ANALYSIS (SAGITTAL, FRONTAL, AND TRANSVERSE PLANES).
- SUPPORT THE LONG-TERM WELL-BEING OF THE WHOLE PERSON SO WE CAN PROMOTE OPTIMAL PERFORMANCE FOR AGING ATHLETES.



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Chapter 16

Research has shown that athletes who consistently get less than eight hours of sleep double their injury risk

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