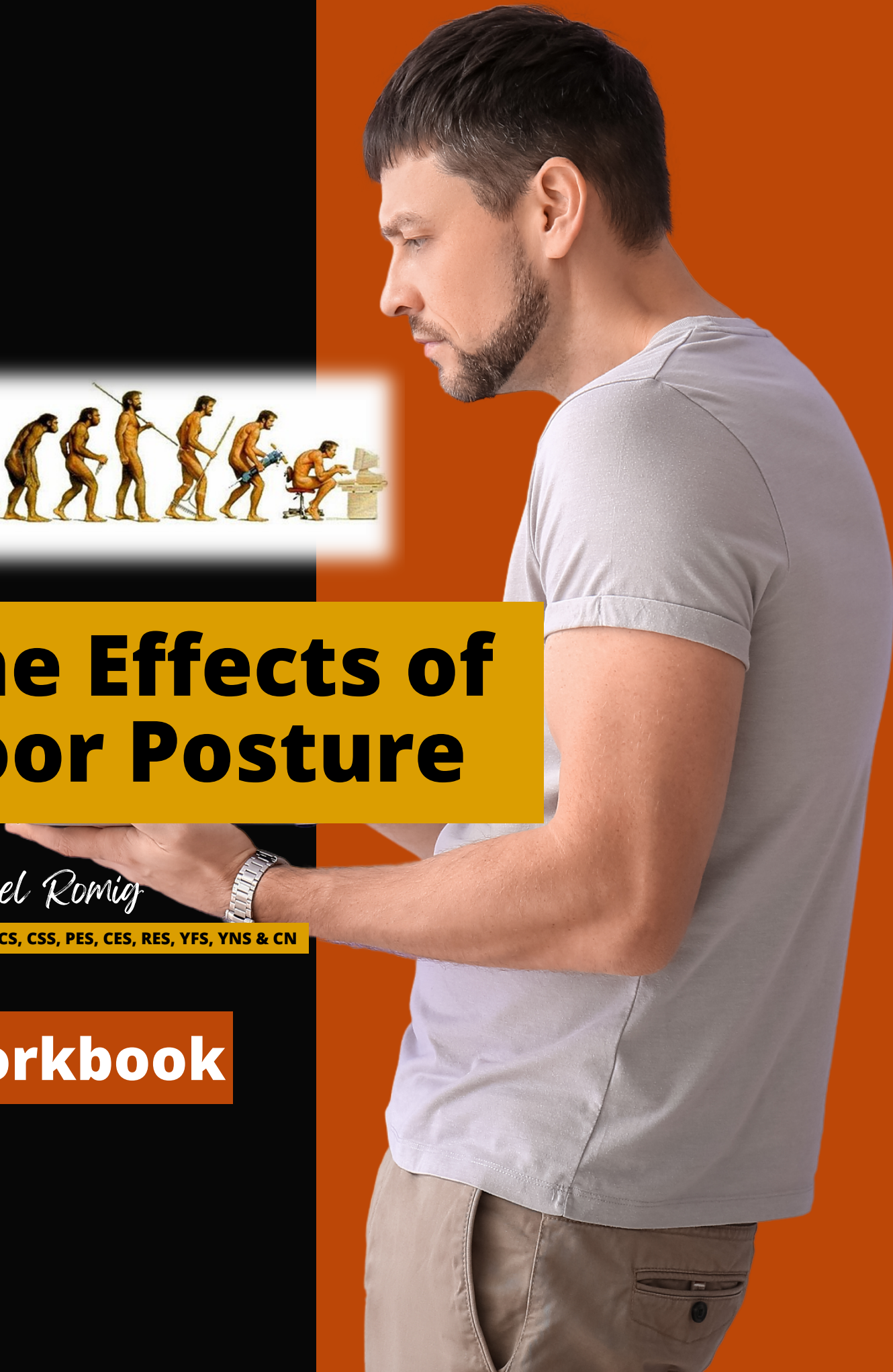


The Effects of Poor Posture

Michael Romig

MS, MT, CSCS, CSS, PES, CES, RES, YFS, YNS & CN

Workbook



Vicious Circle of Dysevolution



1

Decreased activity and poor posture can lead to musculoskeletal pain, muscle imbalances, postural deviations, and injuries

2

Musculoskeletal pain will affect nearly everyone (El-Tallawy et al., 2021)

3

At least a quarter of the world's population will experience chronic musculoskeletal pain (Gregory & Sluka, 2014)

4

Musculoskeletal pain will cost nearly \$500 billion annually (Gregory & Sluka, 2014)



Why are Novelty & Comfort Problems?



- Our bodies are not well adapted for sitting too much (Lieberman, 2013)
- We frequently mistake comfort for well-being (Lieberman, 2013)
- We would rather address the symptoms than the solution (Lieberman, 2013)





Evolutionary Mismatches



- Foot and Ankle Injuries
- Low-Back Pain
- Knee Injuries
- Shoulder Injuries

Write in four mismatches

1.

2.

3.

4.



What is Poor Posture?

Feet

Externally Rotated

Knees

Adducted and Rotated Inward

Lumbo-Pelvic-Hip Complex

Excessive Anterior or Posterior pelvic tilt

Shoulders

Rounded and/or Elevated

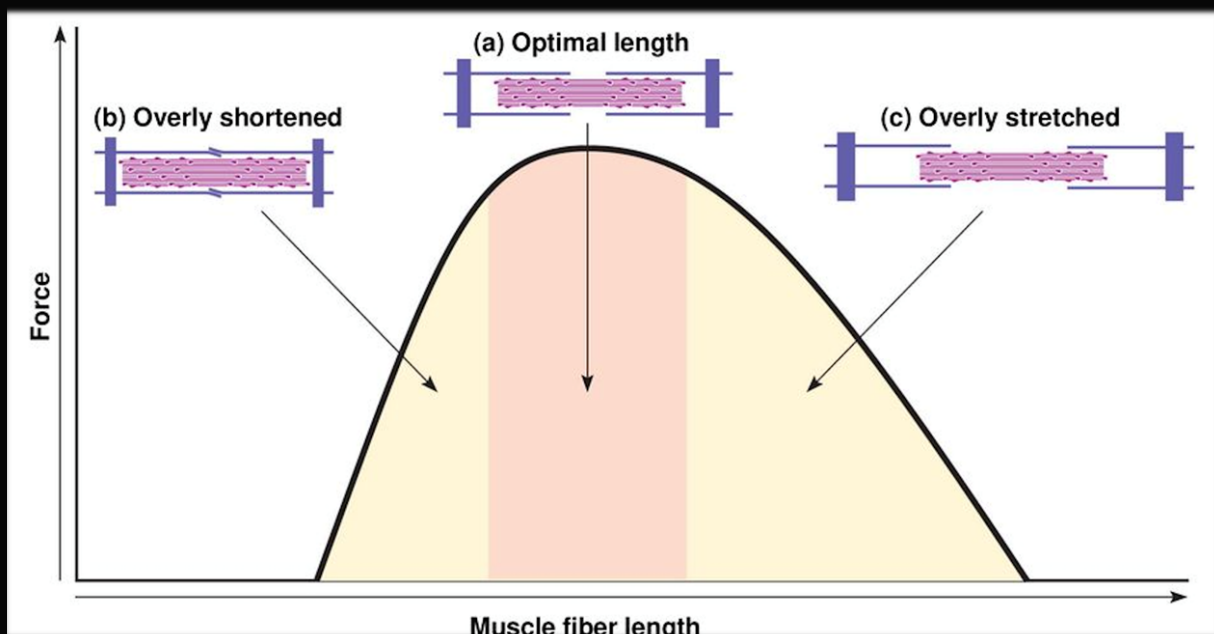
Cervical Spine

Forward and/or Extended



The Length-Tension Relationship

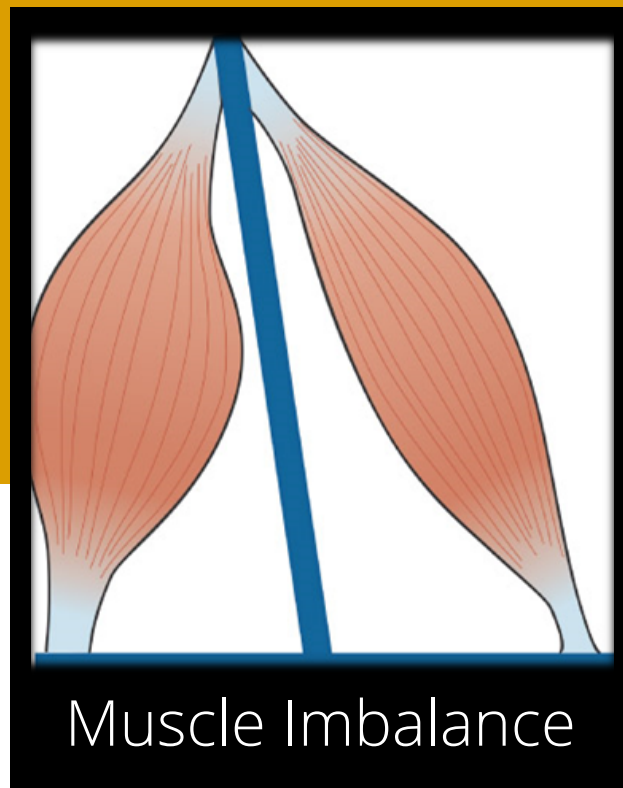
There is an optimal muscle length at which the actin and myosin filaments in the sarcomere have the greatest degree of overlap (Williams et al., 2013)





**Short or
Tight Muscle**

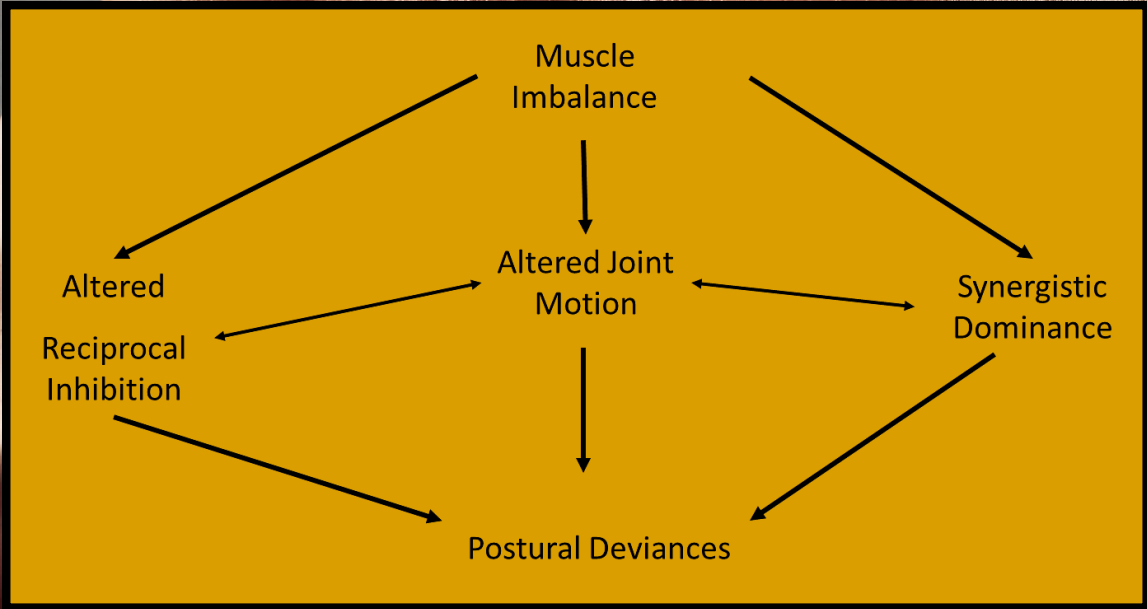
**Lengthened or
Weak Muscle**



Muscle Imbalances

It is the alteration of muscle length surrounding a joint. One side of the opposing muscle is stronger than the other (Clark et al., 2014)





Effects of Muscle Imbalances

Fill in the effects of muscle imbalances

1.

2.

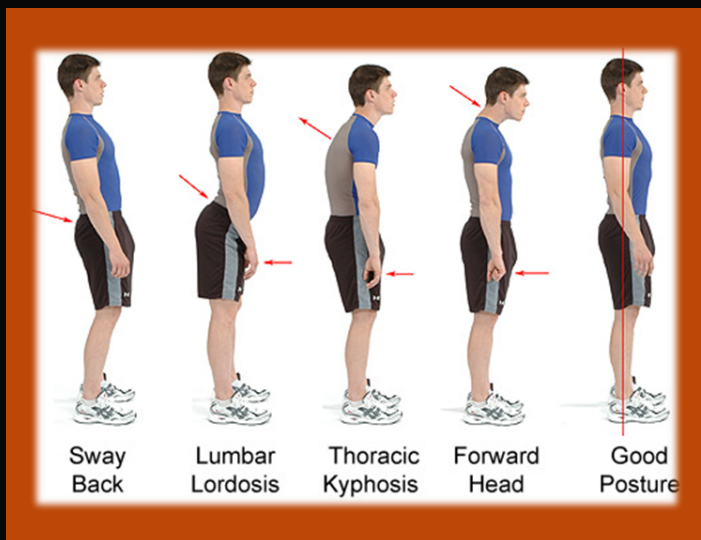
3.

4.

5.

Postural Deviances

- Lower Crossed Syndrome
- Upper Crossed Syndrome
- Pronation Distortion Syndrome



Fill in three postural deviances

1.

2.

3.

Foot and Ankle Complex

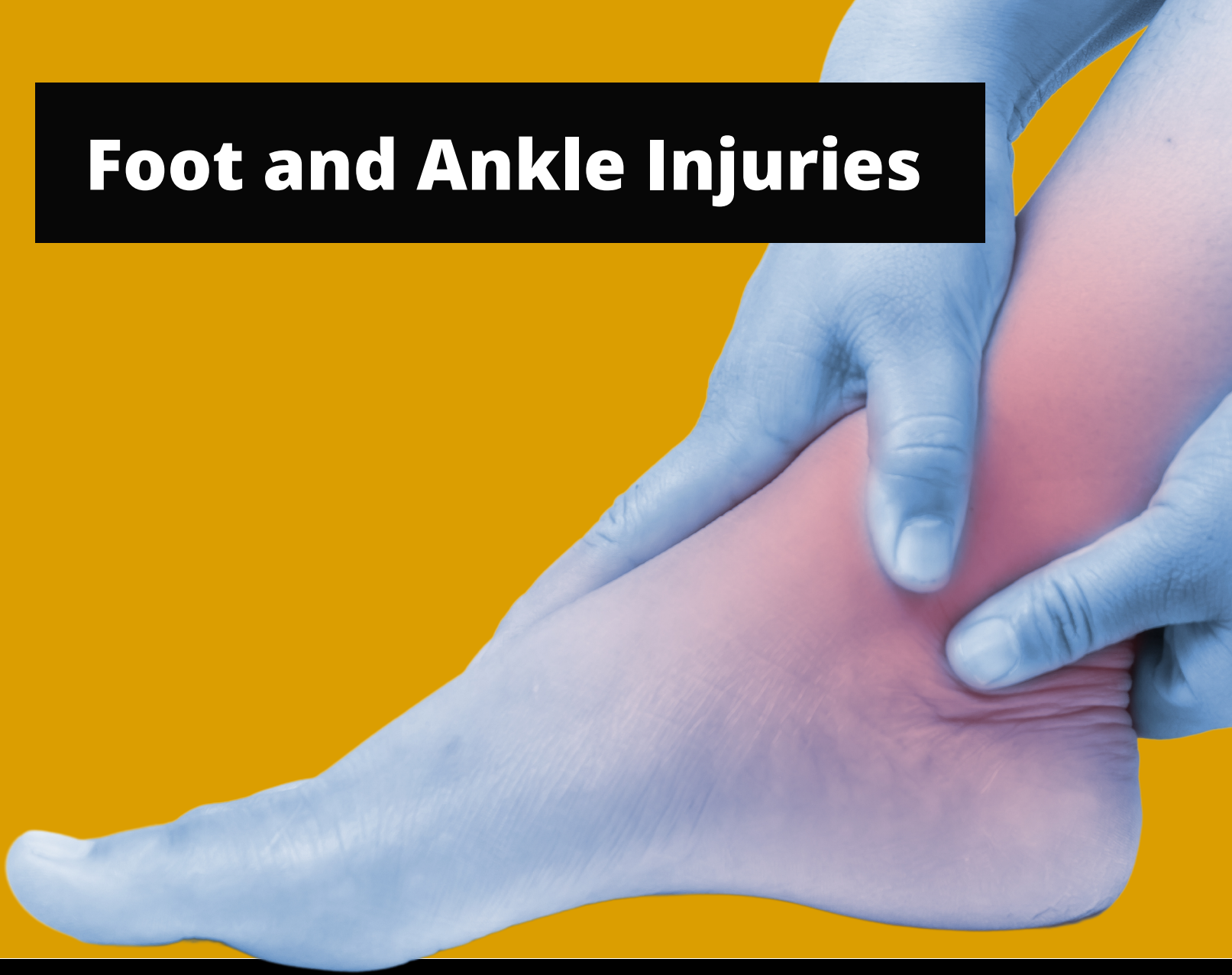
- 13 muscle groups, dozens of ligaments and 4 layers of muscle
- Common impairments of the foot and ankle include:
 - Over pronation or flat feet
 - Decreased joint motion of the first metatarsophalangeal joint
 - Increased impact peak
 - Decreased posterior glide of the talus
 - Decreased dorsiflexion at the ankle

This can lead to excessive pronation, increasing the risk for ankle sprains and plantar fasciitis



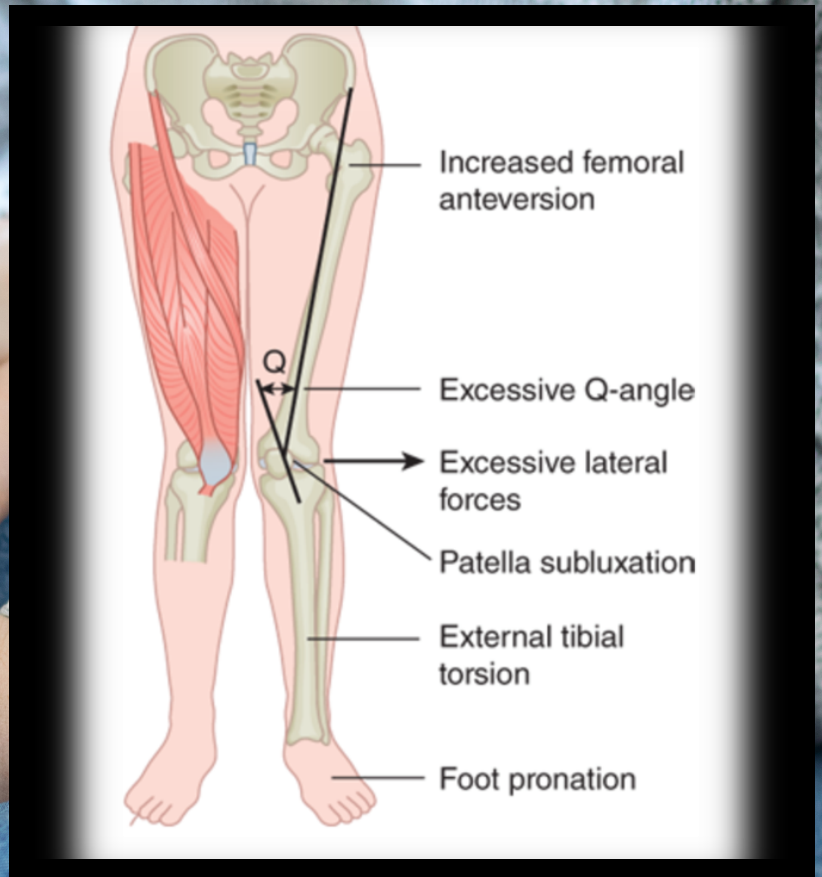


Foot and Ankle Injuries



- **Plantar fasciitis accounts for over 1 million doctor visits per year (Riddle & Schappert, 2004)**
- **Ankle sprains are reported to be the most common injury (Herzog et al., 2019)**
- **Barefoot people almost never have flat feet (Lieberman, 2013)**





Knee Complex

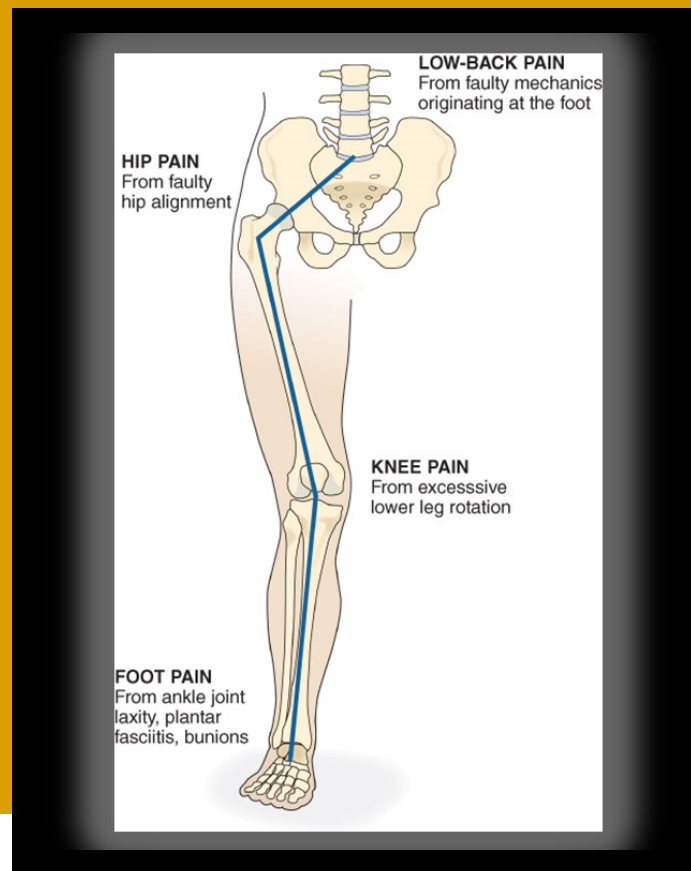
- Seven muscles of the thigh, 4 bones and a network of ligaments
- Common impairments affecting the knee include
 - Flat feet
 - Increased Q-angle
 - Excessive anterior pelvic tilt
 - Decreased flexibility of the quadriceps, hamstrings, and IT-band



Knee Injuries

- An estimated 80,000 to 100,000 ACL injuries occur annually (Donnell-Fink et al., 2015)
- Approximately 84% of these are noncontact injuries (Landis et al., 2018)





Lumbo-Pelvic-Hip Complex

- 29 muscles make up the LPHC
- Most back problems originate in the foot
- Muscle imbalances caused by sitting contribute to back pain (Lieberman, 2013)
- Excessive anterior pelvic tilt
- If the neutral lordotic curve of the lumbar spine is not maintained
 - Activation of the muscle fibers decreases
 - Increases risk of vertebral disc injuries



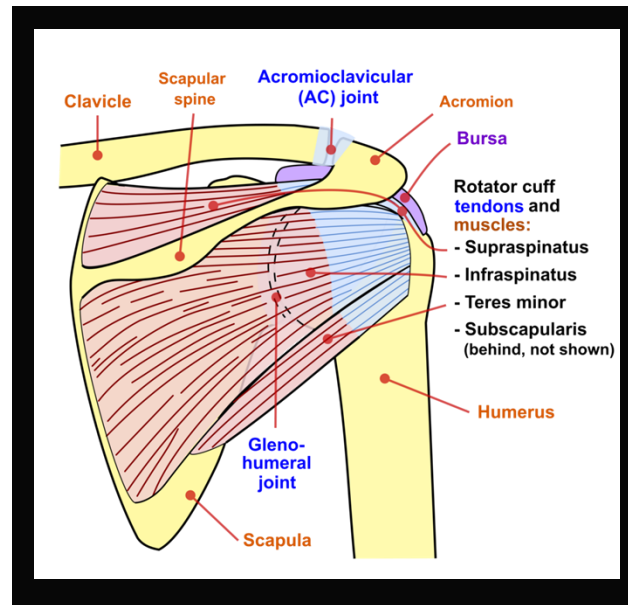
Low-Back Pain

- Approximately 80% of all adults will experience back pain (Fatoye et al., 2019)
- More than 1/3 of all work-related injuries involve the trunk
 - Over 60% involve the low back
 - Economic burden greater than \$26 billion (annually)





Shoulder Complex



- 20 muscles including the 4 rotator cuff muscles, and two joints (AC and the glenohumeral joints)
- Rounded shoulders
 - Alters the normal length-tension relationship and joint kinematic balance of the shoulder complex
- Shoulder injuries affect the
 - Rotator cuff muscles
 - Capsuloligamentous structures of the shoulder
- Predictable patterns of injury include:
 - Rotator cuff impingement – strains, ruptures, tendinopathies
 - Shoulder instability





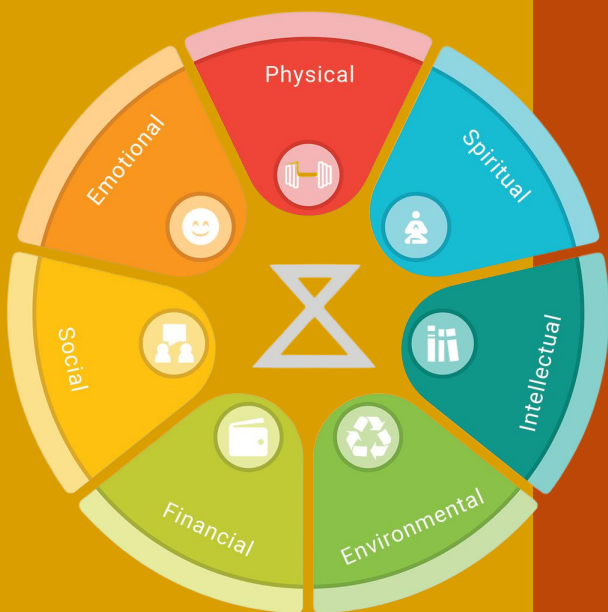
Shoulder Injuries

- **Shoulder Pain**

- 26% of the general population (Linake & Walker-Bone, 2015)
- Impingement is the most prevalent
- Estimated annual cost of \$39 billion



Effects on Wellness



- Physical - musculoskeletal pain will affect nearly everyone (El-Tallawy et al., 2021)
- Intellectual - influence on cognitive function (Spindler et al., 2018)
- Spiritual – moderate but significant correlation on spiritual well-being (Siddall et al., 2017)
- Environmental – detrimental effects on environment (Bushnell et al., 2015)
- Financial - \$500 billion annually (Gregory & Sluka, 2014) US spends 2 trillion on health care (20% of GDP) & 70% are preventable (Lieberman, 2103)
- Social & Emotional – profound impact (Tüzün, 2007)



Effects on Occupational Deprivation



- A state of preclusion from engagement in occupations of necessity and/or meaning due to factors that stand outside the control of the individual (Whiteford, 2010)
- If an individual is restricted or limited from an opportunity to complete desired occupations, they have been affected by occupational deprivation (Shaw et al., 2012)
- As Lieberman (2013) suggested, we could be headed to a future like the one described in the movie WALL-E, in which we balloon into a race of fat, chronically ill weaklings who are dependent on medications, machines, and big corporations to survive



Why Posture Matters?

- Poor posture can lead to musculoskeletal pain, muscle imbalances, postural deviations, and injuries
- Remember evolutionary mismatches are symptoms not causes
- Good posture...
 - Helps to avoid musculoskeletal tension and pain
 - Keeps joints and bones in proper alignment
 - Establishes the proper length-tension relationship in muscles
 - Places the joints in ideal alignment during motion







What's the Solution?

- Our bodies were simply not adapted to handle many modern technologies, like sitting, at least not in extreme quantities or degrees
- The solution is not to rid ourselves of modern conveniences but to halt the cycle of dysevolution in which we treat the symptoms of the problems they create rather than addressing their causes (Leiberman, 2013)
- Be physically active; people who are more physically active are more likely to live longer, age better, and have fewer musculoskeletal issues (Cook & Schoeller, 2011)
- Identify muscle imbalances and postural deviations by going through a biomechanical assessment

Fill in the four points of good posture

1.

2.

3.

4.

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