



# Core Strength

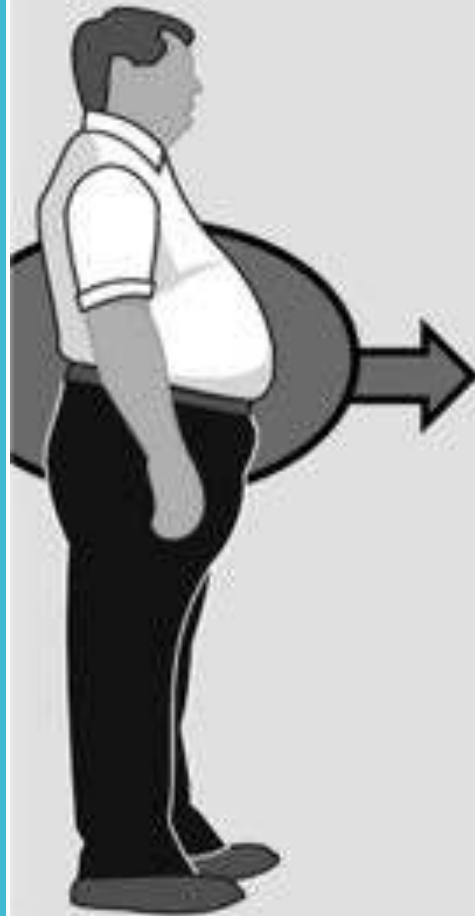
Rachel Lindsey, PhD, ATC, CSCS, CISSN

February 28, 2018

# Learning Objectives

- Define the core
- Define core strength
- Give examples of how to approach a core strengthening program with patients

# Abdominal Obesity & Cardiovascular Risk Factors



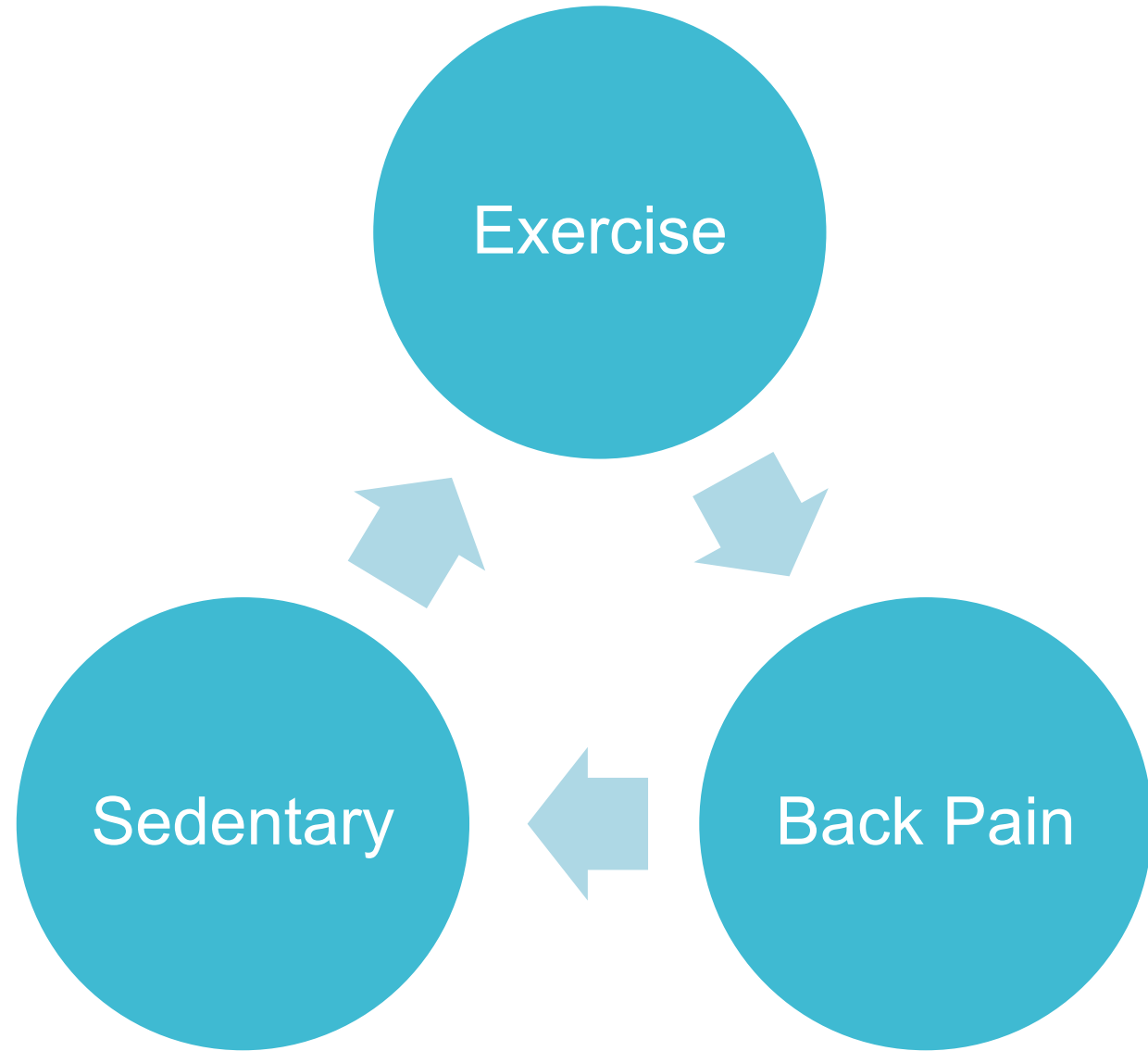
- Hypertriglyceridemia
- Low HDL-cholesterol
- High apolipoprotein B
- Small, dense LDL and HDL
- Inflammation
- Insulin resistance
- Hyperinsulinemia
- Glucose intolerance
- Altered fibrinolysis
- Endothelial dysfunction

↑ Risk of CVD and  
type 2 diabetes

# Lifestyle Modification



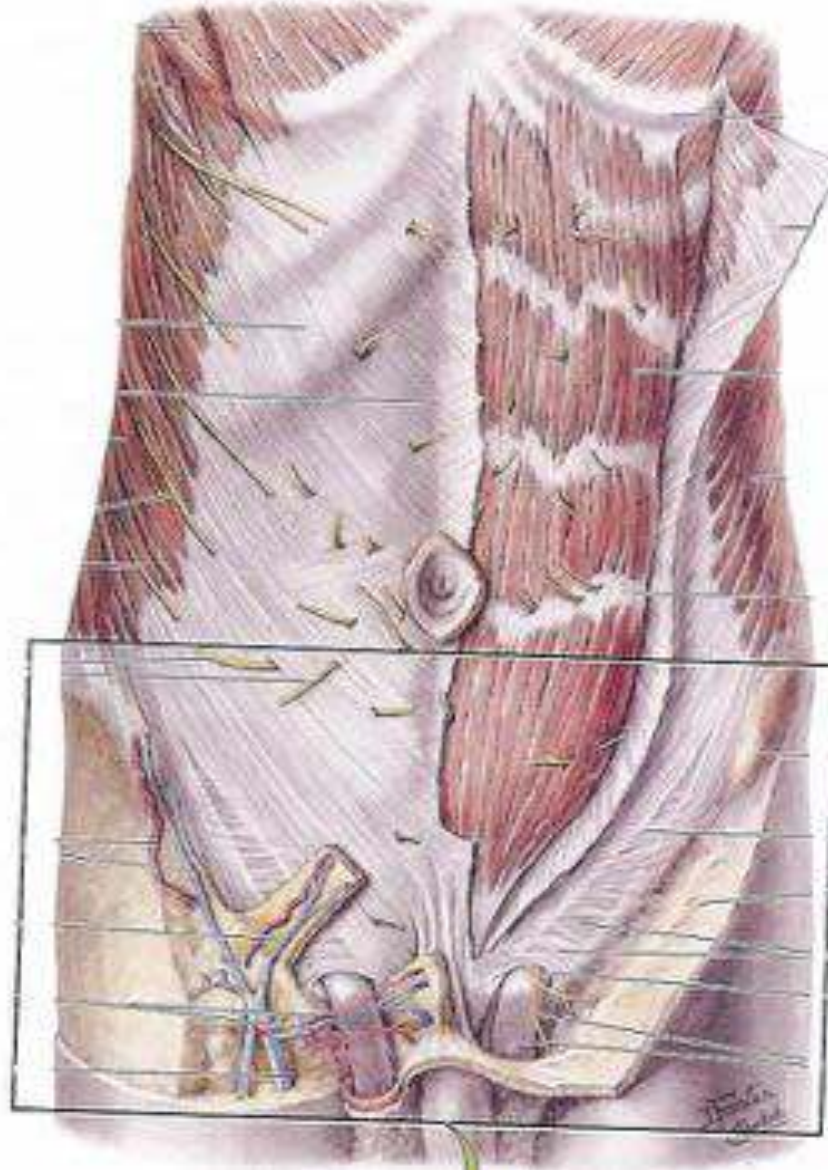
Back Pain  
-80% of adults



What is the  
Core?



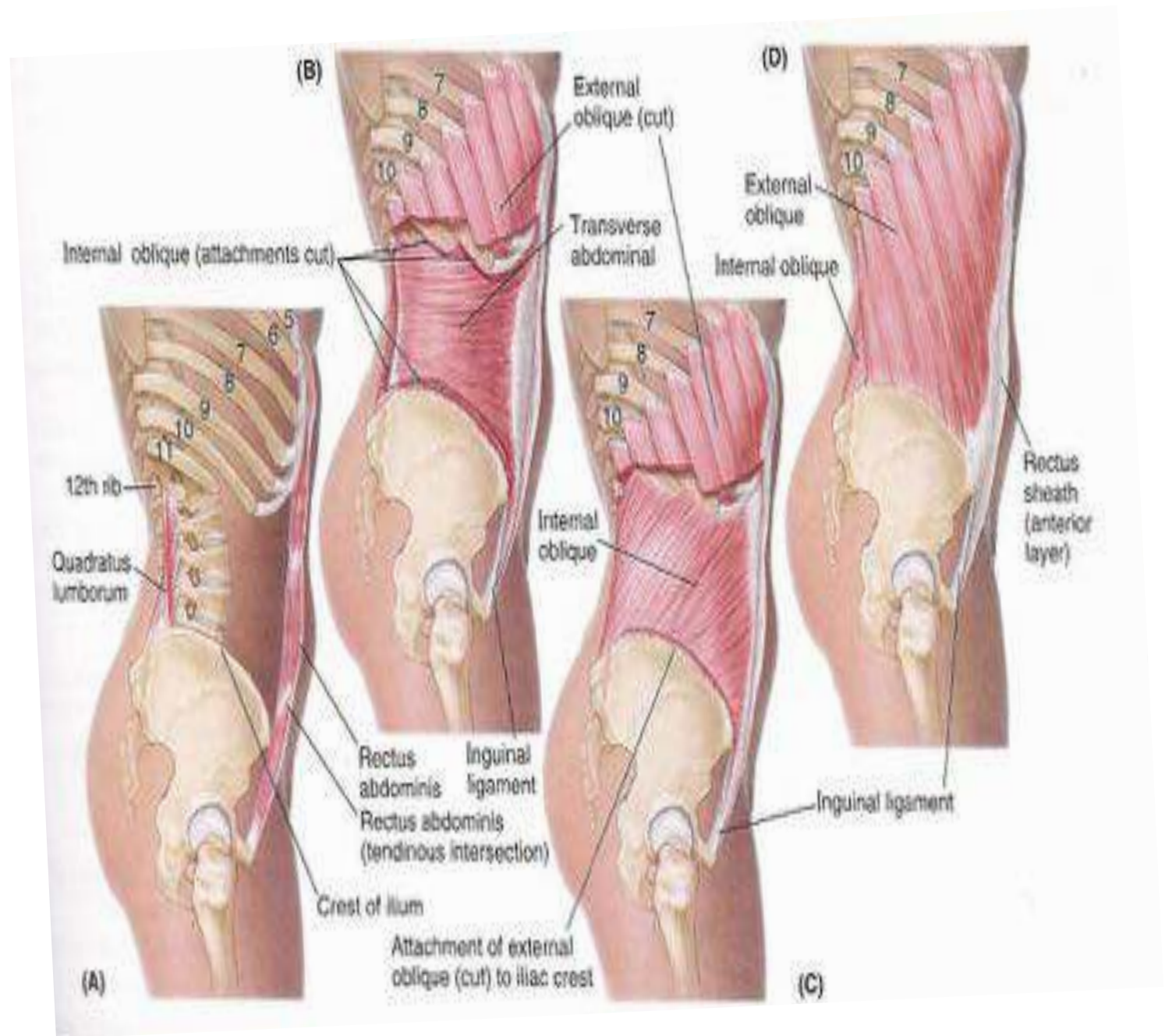
# Rectus Abdominis





# Abdominal Wall

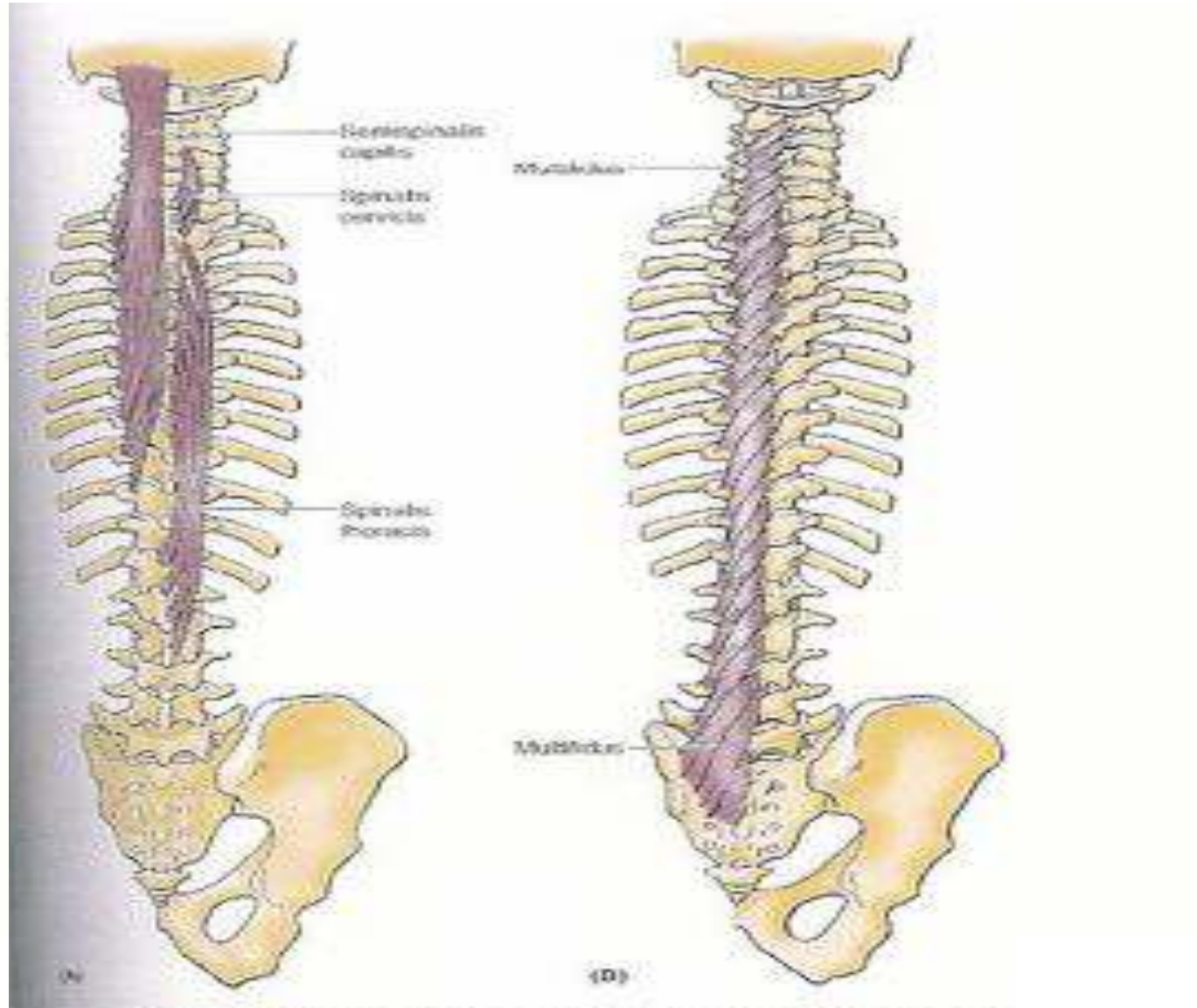
External Oblique  
Internal Oblique  
Transverse Abdominis





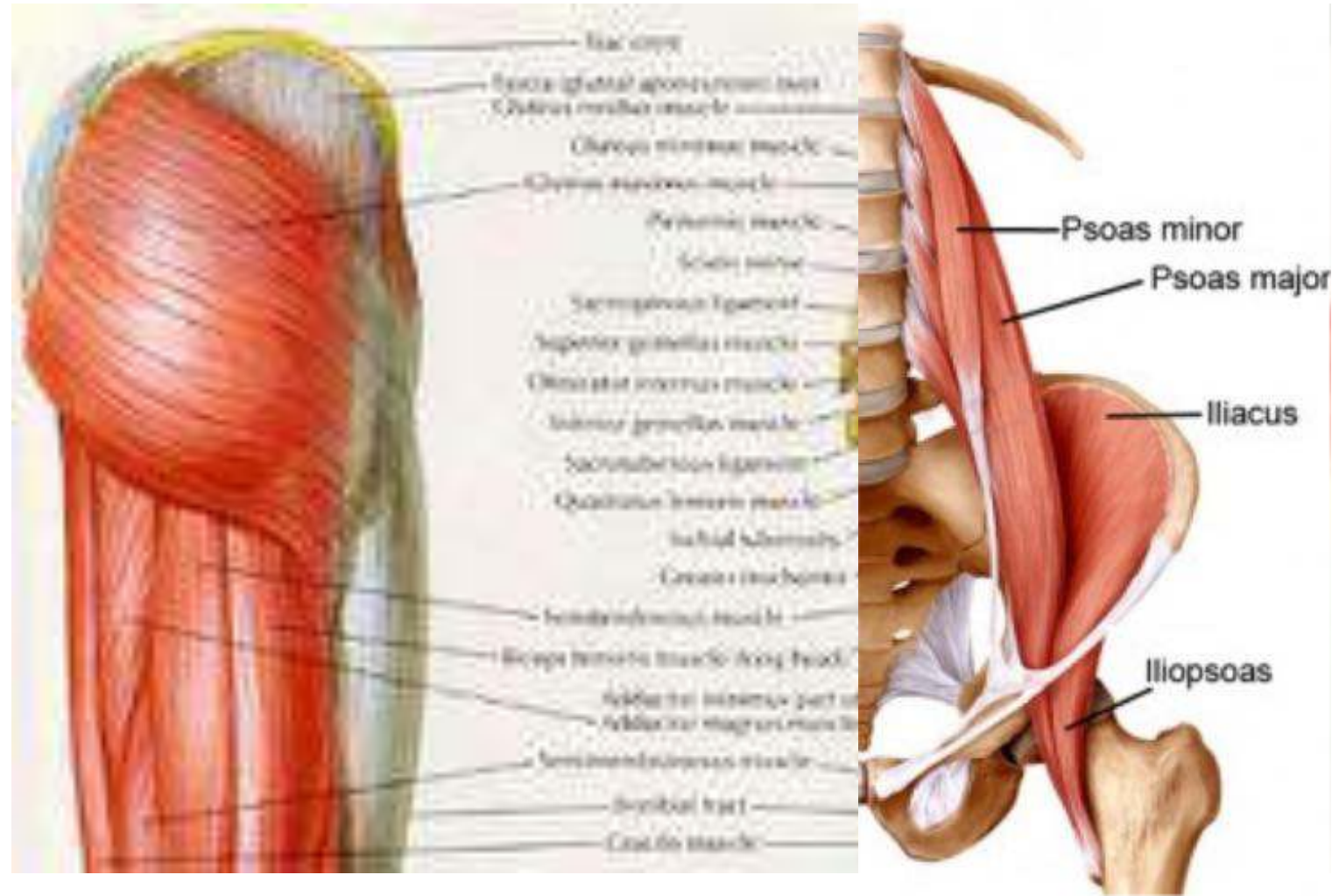
# Posterior Musculature

Scapular Stabilizers  
Latissimus Dorsi  
Erector Spinae  
Transversospinalis

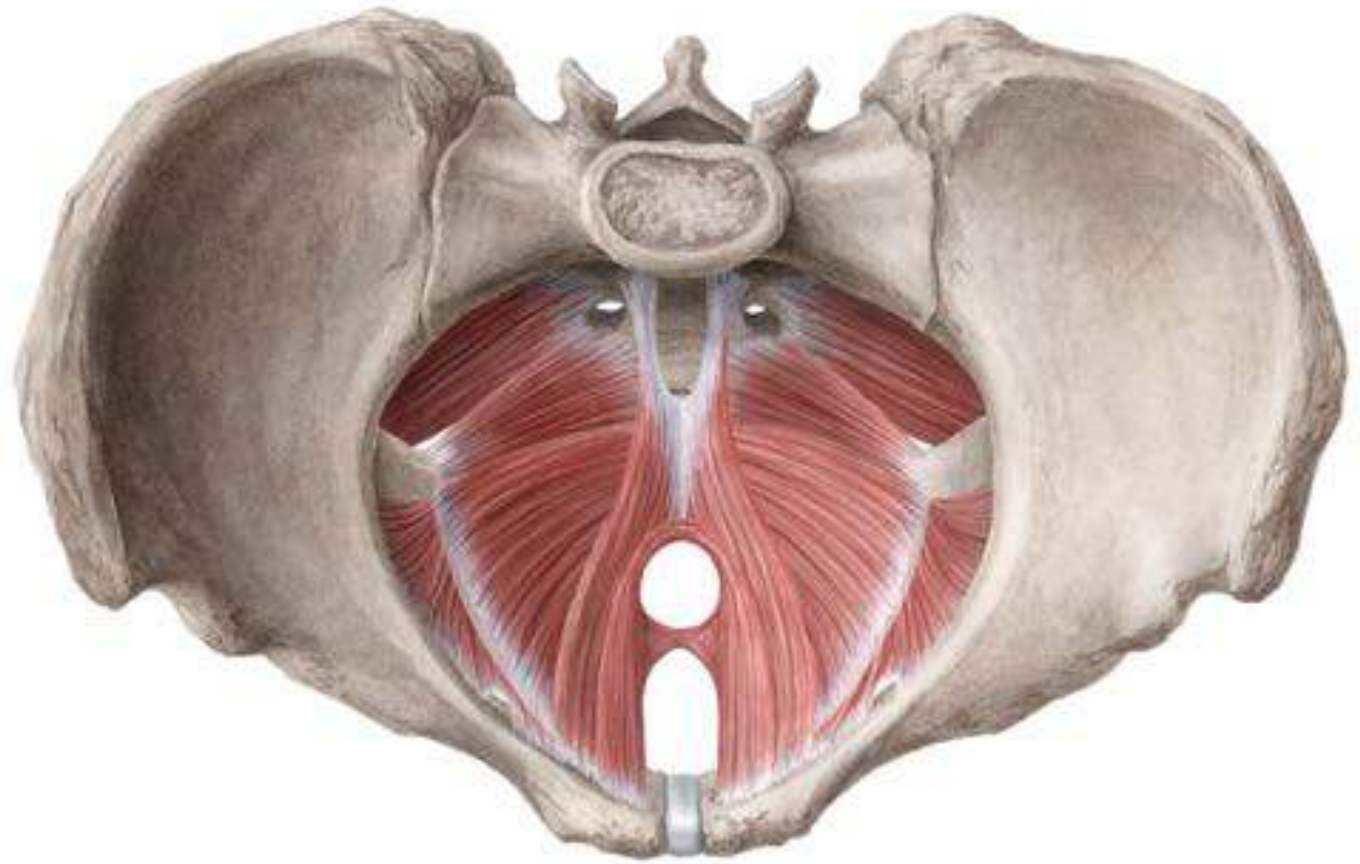


# Hip Musculature

Gluteus Maximus  
Gluteus Medius  
Iliopsoas



# Pelvic Floor



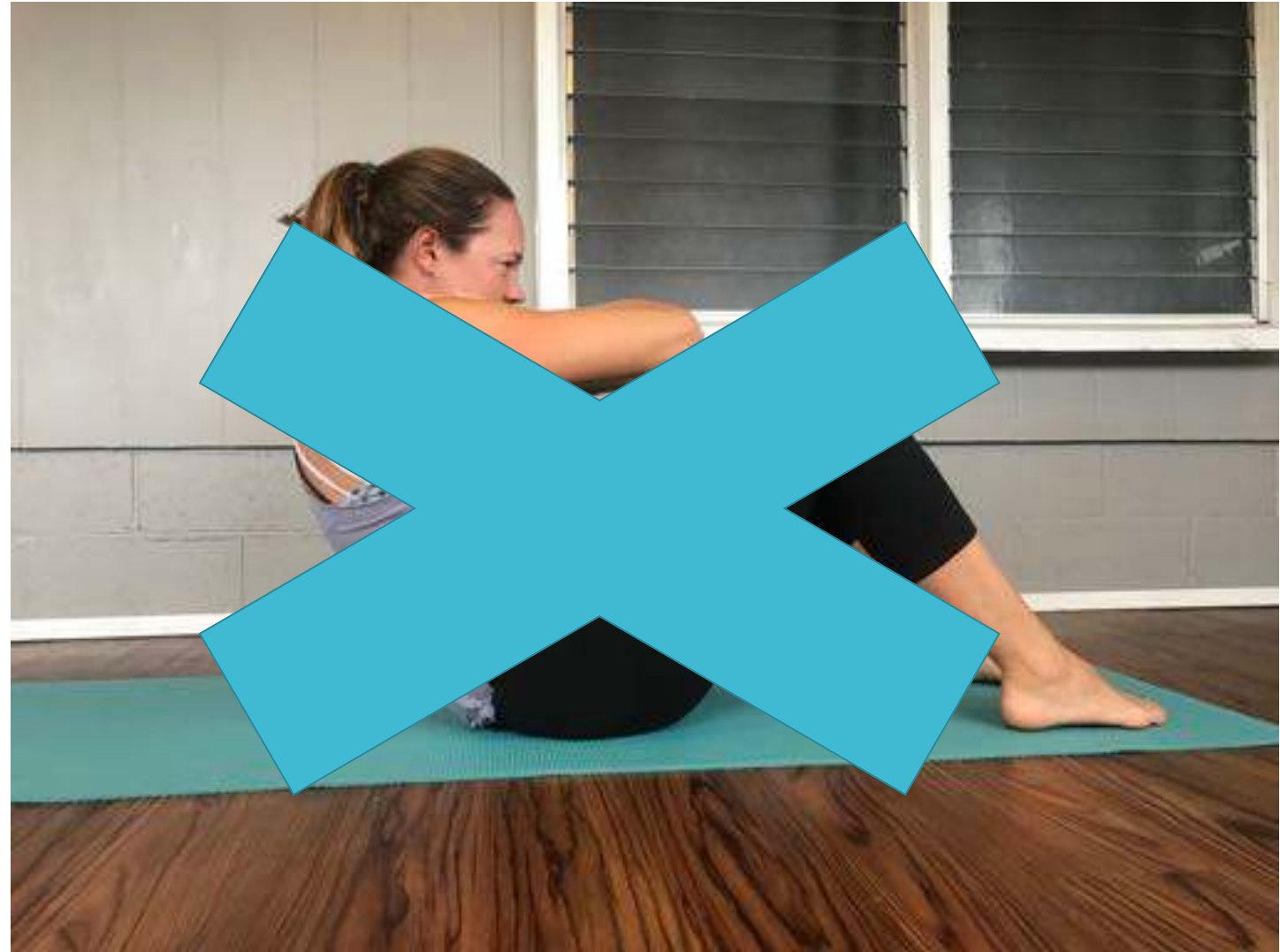


**How do we strengthen the core?**

# Sit-Up

- Spinal flexion does not engage abdominals past 30 degrees
- Repeated spinal flexion can promote or aggravate injury

Callaghan et al. 2001.





# What is Core Strength?

- Resist motion, not create it
- Ability to work synergistically
- Force transfer
- Endurance



# The Big Three

- Spinal stability
- Optimal motor patterns
- Safe spinal positions
- Build endurance



# Primers

Posture  
Breathing  
Bridge



# The Big Three Progression

- Start by building endurance
- Begin with 10 second holds and increase repetitions (not length of time)
- Then increase level of difficulty

# Modified Curl Up





# Bird Dog



# Bird Dog





# Side Plank



# Advanced Plank



# Plank Form Errors





Advanced



# Conclusions

- Core training is the foundation of any exercise program
- Having adequate core strength will help to decrease injury risk and increase performance in order for the patient to safely engage in a full body regimen

# Questions?

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From: **Genetic Association of Waist-to-Hip Ratio With Cardiometabolic Traits, Type 2 Diabetes, and Coronary Heart Disease**

JAMA. 2017;317(6):626-634. doi:10.1001/jama.2016.21042

**Key Points**

**Question** Is genetic evidence consistent with a causal relationship among waist-to-hip ratio adjusted for body mass index (a measure of abdominal adiposity), type 2 diabetes, and coronary heart disease?

**Findings** In this mendelian randomization study, a polygenic risk score for increased waist-to-hip ratio adjusted for body mass index was significantly associated with adverse cardiometabolic traits and higher risks for both type 2 diabetes and coronary heart disease.

**Meaning** These results provide evidence supportive of a causal association between abdominal adiposity and the development of type 2 diabetes and coronary heart disease.

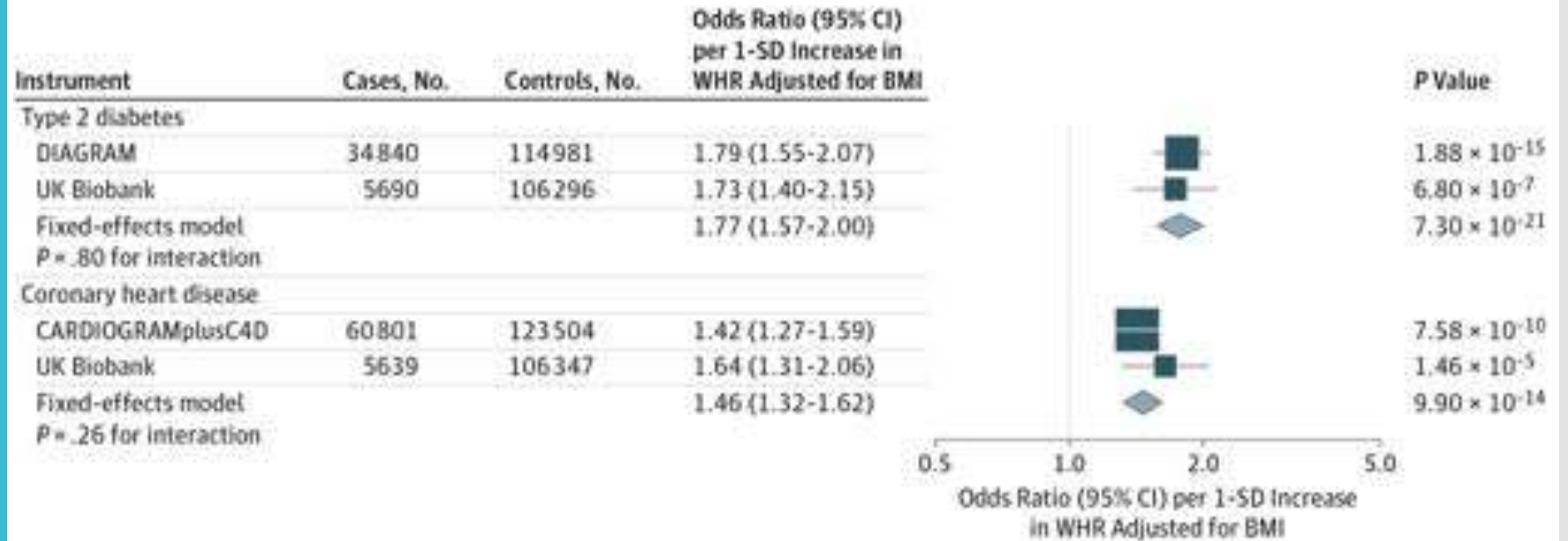


Figure Legend:

Association of 48-SNP Polygenic Risk Score for WHR Adjusted for BMI With Type 2 Diabetes and Coronary Heart Disease Results are standardized to a 1-SD increase in waist-to-hip ratio adjusted for body mass index due to polygenic risk score. Estimates were independently derived in genome-wide association studies (CARDIOGRAMplusC4D for coronary heart disease and DIAGRAM for type 2 diabetes) and the UK Biobank. The threshold of significance was  $P < .025$  ( $0.05/2 = 0.025$ ). Size of data markers is inversely proportional to variance of estimate. CARDIOGRAMplusC4D indicates Coronary Artery Disease Genome-Wide Replication and Meta-analysis plus the Coronary Artery Disease Genetics Consortium; DIAGRAM, Diabetes Genetics Replication and Meta-analysis.