Course Title: **Biomechanics of Low Back Pain**

Produced by: **Fitness Learning Systems**  
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Course Type: **e-Learning Home Study**

Credits:  
AEA 3.0, ACSM 4.0, ATRI 0.3, NFPT 1.0, NCSF 1.5,  
NSPA 4.0, YMCA 4.0, NASM 0.4, NSCA 0.4, COPS-KT 0.4

Author:  
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Dr Emily Splichal, Podiatrist and Human Movement Specialist, is the Founder of the Evidence Based Fitness Academy. With over 10 years in the fitness industry, Dr Splichal has dedicated her medical career towards studying postural alignment and human movement as it relates to foot posture and foot strength. Dr Splichal is expert lecturer and TV personality with appearances on Oprah Winfrey, The Today Show & Good Day NY. Dr Splichal is sought after for her expertise in barefoot training, foot health and postural alignment.  
**Degrees/Certifications:** Doctor of Podiatric Medicine (DPM), Master's in Public Health (Fall Reduction), M.S. Human Movement, NASM-CPT, ACSM- Exercise Specialist.

Course Summary:

Almost 80% of American adults will suffer low back pain at some point. Interestingly, 70-80% of LBP is associated with musculoskeletal imbalances and improper core activation during everyday movement. Join us as we take a look at the latest research on the biomechanics of low back pain. From the hip to the foot, you will be surprised by how many different imbalances attribute to low back pain. This course helps you learn how to alleviate and prevent low back pain from the foot up through the kinetic chain.

Objectives:

After completing this course you will:
1. Demonstrate the important role the fitness professional plays in educating, rehabilitating and enhancing function in clients with low back pain.
2. Describe the lumbopelvic hip complex and identify the local and global stabilizers of this region.
3. Understand the biomechanical link between lower extremity kinematics and spine function.
4. Identify how foot dysfunction can cause low back pain and how to effectively improve foot function to correct low back pain.
5. Explain how hip and pelvis dysfunction can lead to foot dysfunction and understand how to correct this hip imbalance therefore correcting the foot mechanics.
6. Identify how limb length discrepancy can cause sacroiliac joint pain and whether it is functional or structural limb length discrepancy.
7. Assess if delayed activation of the gluteus maximus is a contributing factor to sacroiliac joint pain and if so, learn how to re-activate the gluteus maximus.

8. Create an evidence-based lumbar stabilization program that starts from the foot and extends up the kinetic chain.

Outline:

Low Back Pain Facts

Low Back Pain and the Health-Fitness Professional Case Studies:
   Case Study 1
   Case Study 2
   Case Study 3

The Spine – An Integral Part of the Lower Extremity

Bone Anatomy:
   The Vertebral Column
   Facet Joints of the Spine
   Intervertebral Disks
   Disk Herniation
   Pelvis
   Sacroiliac Joint

Muscle Anatomy:
   Local Musculature System
      Multifidus
      Internal Obliques
      Transversus Abdominis
   Global Stabilizing System
      Rectus Abdominis
      Erector Spinae
      External Obliques
      Psoas Major
      Quadratus Lumborum
      Gluteus Maximus

Planes and Axis:
   Planes of Motion
      Sagittal Plane
      Frontal Plane
      Transverse Plane
   Axis of Rotation
      Frontal Axis
      Sagittal Axis
      Transverse Axis
   Review Chart of Planes and Axis

Forces Acting on the Spine:
   Ground Reaction Forces
   Compressive Forces and Low Back Pain
   Abdominal Brace
   Shear Forces and Low Back Pain
   Psoas Engagement and Shear Forces

Low Back Assessment:
Thomas test
Abdominal assessment
Strength assessment

The Foot and the Spine:
  Rearfoot
  Midfoot
  Forefoot

Joints of the Foot & Ankle:
  Ankle Joint
  Subtalar Joint
  1st Metatarsal Phalangeal Joint

Foot Type and Low Back Pain:
  Neutral foot
  Pes Planus
  Pes Cavus

Enhanced Spinal Curvatures and Low Back Pain:
  Lordosis
  Scoliosis

Etiology of Low Back Pain:
  Muscle Activation
  Postural Assessment
  Synergistic Dominance
  Muscle Imbalances
    Sagittal Plane Imbalances
    Frontal Plane Imbalances

Evidence-Based Program Design:
  Reversal of Any Muscle Imbalances
    Sagittal Plane Imbalance
    Frontal Plane Imbalance
  Re-Sequencing Muscle Activation Patterns
  Strengthening Lumbar Stabilizers
    Forearm Plank
    Pushup Plank
    Side Plank
    Quadruped
    Modified Curl-Up
    Glute Bridge
    Reverse Plank

Case Studies – Revisited!
  Case Study 1
  Case Study 2
  Case Study 3

Low Back Pain Fitness Pearls

Bibliography:


