

# AI-01503 Pillars of Functional Movement

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Fully functional movement requires three things: mobility (the ability to move in a wide range of motion in your hips, shoulders, upper spine/Tspine, lumber/lower back, knees, ankles); stability (the ability to stay in place momentarily under control); and some minimal strength. Without the three, you get dysfunctional muscle activation—kind of a noodle-y feel—when doing most multijoint exercises.

You've hit on a fundamental truth about human movement: it's a complex interplay of different factors, not just raw power. Let's break down each component and explore how they contribute to "fully functional movement" and what happens when they're lacking.

## 1. Mobility: The Foundation of Movement

- Definition: Mobility refers to the active range of motion around a joint. It's not just passive flexibility (how far you can stretch), but the ability to control that range of motion.
- Why it Matters:
  - Efficient Movement Patterns: Adequate mobility allows your body to move through its intended movement patterns without compensation. For example, proper hip mobility is crucial for a deep squat without straining your lower back.
  - Injury Prevention: Restricted mobility can force other joints to compensate, leading to overuse injuries. Tight hip flexors, for instance, can contribute to lower back pain.

- Optimal Performance: In any athletic endeavor, good mobility allows for greater power generation and efficiency.
- Key Areas:
  - Hips: Essential for walking, running, squatting, and many other daily activities.
  - Shoulders: Crucial for overhead movements, lifting, and rotational movements.
  - Thoracic Spine (T-spine): Rotation and extension in the T-spine are vital for posture and movements like swinging and throwing.
  - Lumbar Spine (Lower Back): While stability is paramount here, some mobility is necessary for healthy movement.
  - Knees and Ankles: These joints need adequate mobility for proper gait and lower body strength exercises.

## 1. Stability: Controlled Movement

- Definition: Stability is the ability to maintain control and posture during movement. It's about resisting unwanted movement and maintaining a stable base.
- Why it Matters:
  - Joint Protection: Stability protects joints from excessive stress and strain.
  - Force Transfer: A stable core and joints allow for efficient transfer of force during movements.
  - Balance and Coordination: Stability is essential for maintaining balance and coordinating complex movements.
- How it Works: Stability is often achieved through the activation of core muscles and other stabilizing muscles around joints.
- Examples:
  - Maintaining a stable spine during a plank.
  - Controlling knee movement during a lunge.
  - Maintaining a stable shoulder during a pushing movement.

## 1. Minimal Strength: The Engine of Movement

- Definition: Strength is the ability to produce force. It's the capacity to move or resist a load.
  - Why it Matters:
    - Movement Execution: Strength provides the power needed to perform movements.
    - Structural Support: Strong muscles support joints and maintain posture.
    - Functional Capacity: Strength is essential for everyday activities and athletic performance.
  - "Minimal" Strength: It is important to note that the term minimal, does not mean unimportant. It means that to have functional movement, you don't have to be a power lifter. You do however, have to have enough strength to control your body through its range of motion.
  - Examples:
    - Having enough leg strength to stand up from a chair.
    - Having enough core strength to maintain a stable spine during lifting.
    - Having enough shoulder strength to lift objects overhead.
- Dysfunctional Muscle Activation: The "Noodle-y" Feel
- What it Is: When mobility, stability, or strength are lacking, the nervous system struggles to coordinate muscle activation. This leads to inefficient and uncontrolled movements.
  - The "Noodle-y" Feel:
    - Lack of Control: Muscles may fire out of sequence or with insufficient force, resulting in a feeling of instability and weakness.
    - Compensatory Movements: The body will try to compensate for the lack of stability or mobility, leading to awkward and inefficient movements.
    - Reduced Power Output: The inability to properly recruit and coordinate muscles reduces the amount of force that can be generated.

- Increased Risk of Injury: Compensatory movements and uncontrolled forces increase the risk of strains, sprains, and other injuries.
- Multijoint Exercises: Multijoint exercises, such as squats, deadlifts, and overhead presses, require a high degree of coordination and stability. When these are lacking, the "noodle-y" feel is particularly pronounced.

In Summary:

Fully functional movement is a synergistic process. Mobility provides the range, stability provides the control, and strength provides the power. When all three are present, movement is efficient, controlled, and powerful. When one or more are lacking, movement becomes dysfunctional, leading to a "noodle-y" feel and an increased risk of injury. Addressing these deficiencies through targeted exercises and training is essential for optimal movement health and performance.