

Beth Kais  
[www.bethkais.com](http://www.bethkais.com)  
IG - BethKais33139

## **The Right-Handed Golfers Dilemma – Newton’s second law of motion and why how we are made affects your performance**

$$\mathbf{F=MA}$$

Force = Mass x Acceleration. Simple equation – difficult execution.

In force generation mass and acceleration each make up 50% of the equation. Acceleration gets the all the attention because it is the easiest to measure and compare. Swing faster - drive the ball farther. What about the other half of the equation? Why not focus on the movement of the mass as well to improve both factors that determine drive distance?

Evaluating and improving mass transfer from the top of the back swing through the golf swing to the top of the finish requires attention to how the body moves, how the pelvis, hips and spine rotate (or do not rotate) and why these ranges of motion can become altered and elusive.

Unlike both sides Newton’s equation the two sides of our body are not created equal causing the two halves of the golf swing, takeaway and finish to move differently. What?!?! How?

Short Answer – The right and left sides of our body are not the same. In fact, the right side of our body is slightly heavier than the left side.

- On average the liver (right side) outweighs the spleen (left side) by 1.41 to 4.13lbs in men and 1.05 to 5.74lbs in women (<https://www.verywellhealth.com/how-much-do-your-organs-weigh-4105246>).
- The right lung is larger and weighs more than the left lung ([https://www.physio-pedia.com/Lung\\_Anatomy](https://www.physio-pedia.com/Lung_Anatomy) )

This weight difference, in the absence of a very active lifestyle, is enough to pull the body’s center of mass from the middle of the pelvis to over the right hip. When this happens moving and turning to the right becomes easy (already halfway there) and moving and turning to the left becomes more difficult.

For the right handed golfer completing the take away to the top of the swing becomes much easier than completing the follow through to the finish.

Why?

The two halves of the body move in opposite directions while centered on top of the right hip.

When the body’s center of mass settles over the right hip the right hip tilts under or backward and turns inward held in this position by tight right

- Abdominal muscles
- Back of thigh/hamstrings
- Inner thigh/adductors in and
- Hip internal rotators

However, the opposite happens to the left hip. On the left side the left hip tilts forward and turns outward held in this position by tight left

- Low back
- Front of thigh/hip flexors (psoas)
- Outer thigh/abductors

- Hip external rotators

The body's center of mass shifted over the right hip is the ideal body position at the top of the swing.

The body's center of mass shifted over the left hip is the ideal position at the top of the finish.

If the body's center of mass remains, whole or in part, over the right side the body's center of mass is not fully transferred to the left side. This reduces the amount of "M" in Newton's equation as a portion of the mass remains on the right side behind the ball instead of moving through the ball to drive it forward.



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The balanced golfer takes the position at the top of the swing centered over the right hip and transitions it perfectly to centered over the left hip as the body's center of mass moves from the right side to the left side driving the ball forward.

During the follow through to the finish the unbalanced golfer's body remains centered over the right hip and never transitions to centered over the left hip. This inability to transfer the bodyweight from right to left reduces drive distance. More importantly the lack of weight transfer is actually a result of multiple movement compensations that not only decrease distance but also affect ball trajectory/accuracy and can lead to injury.

Compensation - Excessive low back arch/extension

Explanation - Center of mass remains over the right hip causing the upper body to also remain over the right hip, incomplete shoulder turn to the left. Swing movement completed by excessive low back (lumbar L5/S1) rotation.

Result – Fade as the torso fails to turn fully to the left or topping the ball as the torso lifts up as the low back arches/extends



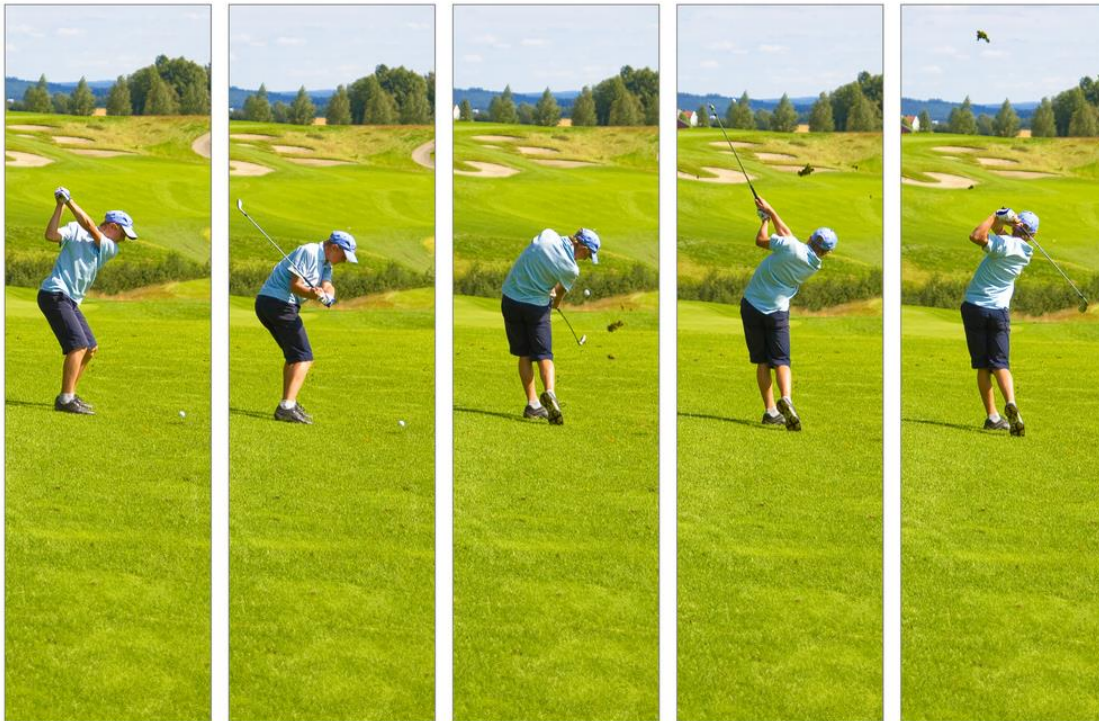
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- Note the
  - o Excessive low back curve
  - o Incomplete shoulder and hip turn
  - o Lifting of the left foot as the hips slide to the left instead of rotating the left hip under/back
  - o Movement of the left foot rotated toward the target
  - o Shoulders remain over the right hip behind the hips.
- Excessive low back rotation and compression on both sides
  - o Potential L5/S1 disc injury
- Excessive left knee torque
  - o Potential left knee injury
- Excessive ankle roll
  - o Potential left ankle injury

Compensation – Body remains centered over the right hip instead of shifting to centered over the left hip.  
Explanation – They bodyweight remains centered over the right hip causing side bending to the right as the hips slide to the left. Movement completed by side bending to the right and shifting or sliding the hips to the left. Movement of the left thigh toward the midline (left hip is moved away and turned out) causes wear and tear in the left hip joint.

Result – Loss of power and club head speed, altered swing arc inside to outside



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- Note in this case the
  - o Incomplete head and shoulder turn
  - o Incomplete torso rotation to the left
  - o Incomplete hip turn (belt remains level/straight to the ground)
  - o Lower spine turns to give the hips more room to turn toward the target
  - o The body remains centered over the right hip by side bending to the right
  - o Hips shift left but body weight remains over the right side
  - o This is the left hip moving toward internal rotation over an externally rotated left hip
- Right side low back compression
  - o Potential left side low back disc injury (pressing down on the right side moves the disc to the left side)
  - o Potential left outer hip injury/irritation
- Excessive lower spine rotation
  - o Potential low back injury
- Movement of the left thigh inward toward the center of the body on a hip that is turned out/away from the midline
  - o Potential left hip socket (labrum) injury
  - o Potential left knee injury



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The Balanced Swing from follow through to the finish

- Note the
  - Shoulders centered over the hips/pelvis
  - Right shoulder moved toward under the chin
  - Right hip turned towards the left hip
  - Unlevel belt line lower on the right side (right hip tilted forward) than the left side (left hip tilted backward)
  - Right thigh moved towards the left thigh
  - Left foot grounded and flat
  - Right foot almost weightless – easily lifted (if tried)

Performance and Health Options

- Power through forcing the body to perform the optimal golf swing. Result – wear and tear, injury, surgery

- Embrace swing faults and work with them. Result – decreased performance and wear and tear, injury, surgery over time
- Correct the muscle imbalances and align the body. Result – improved performance, reduced wear and tear, avoidance of injury or need for surgery

Who corrects these alignment issues? A Postural Restoration and Dynamic Neuromuscular Stabilization specialist.

[www.posturalrestoration.com](http://www.posturalrestoration.com)

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