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Prevention and Treatment of Golf Injuries
“It Takes a Team”

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3-D Video Capture
Computerized 3-D swing Analysis
“Classic Golf Swing”
Ben Hogan
“Modern Golf Swing”
Justin Thomas
“Retired Family Physician Golf Swing”
Unbelievable statistic (from the USGA): “The average golf handicap has not gone down in over 20 years! With all the technology available, golfers haven’t improved!”
Committed Student
Good Teacher
Golf Swing Characteristics

“Flaws”

- Loss of Posture
- Reverse Spine Angle
- Scooping
- Flat Shoulder Plane
- Sway
- Hanging Back
- Casting
- Forward Lunge
- Slide
- Early Extension
- Flying Elbow
- Chicken Wing
- Late Buckle
The Golf Screen
Identifying the Player’s Limitations
Evaluation 1a: Posture Screen (standing)

S-Spine Neutral Spine

C-Spine Neutral Spine

Evaluation 1b: Pelvic Tilt Test (standing)

Objective: Mobility of hips, lumbar spine. The ability to move and control the position of the pelvis is critical for power transfer from lower to upper body.
**Objective:** Can the player stabilize their upper body and freely mobilize their pelvis. Important for proper golf sequencing and generate separation between upper/lower body.
Evaluation 3: Torso Rotation Test (standing)

Objective: Can the player stabilize their lower body and freely rotate their upper body. Important for proper golf sequencing and generate separation or coil.
Objective: One of the most informative tests! If a golfer is unable to perform a full squat with their heels on the ground, it’s almost impossible to maintain posture during the downswing. (Early Extension/Loss of Posture/Flat Shoulder Plane)
**Evaluation 5: Toe Touch Test**

**Objective:** Great test for overall mobility in the lower back and hamstrings. Can help identify a hip problem versus a lower back/core limitation.
**Objective:** The test measures the players **range of external rotation** in the shoulder and the ability to maintain scapular stability in a golf posture. Tested first in a standing position and then compared in a golf posture. Many golfers will lose **range of motion (ROM)** in their golf posture due to lack of scapular stability.
Evaluation 7: Single Leg Balance Test

**Objective:** Measures the **golfer’s overall balance**. Highlights any proprioceptive imbalances from left to right as well as overall stability in the core.
Objective: Evaluates shoulder flexion which includes the flexibility of the lats, shoulder joint restrictions and scapular motion limitations. Tightness in the lats can lead to loss of spinal posture anytime arms are elevated (backswing) and limit the ability to rotate shoulders in the backswing and follow-through. (Loss of Posture, Reverse Spine Angle, limited arm heights, and Over the Top)
Evaluation 9: Lower Quarter Rotation Test

**Objective:** Good way to measure the *rotational mobility of the lower quarter*. The hip, tibia and foot coil and load on the trail leg during the backswing and rotate and post in the lead leg during the downswing. There is potential for *excessive lateral motion in the golf swing (Sway and Slide)* anytime a golfer finds restrictions in the lower quarter.
Evaluation 10: New Seated Trunk Rotation Test

**Objective:** Designed to identify rotational mobility in the thoraco-lumbar spine. Good separation between the upper and lower body is important to help generate speed and maintain a stable posture during the golf swing. Many golfers lack true thoracic spine rotation. This limitation may cause excessive lumbar spine rotational forces or over use the shoulder joint to compensate for limited thoracic spine mobility.
Evaluation 11: Reach, Roll, and Lift Test (Optional)

Objective: Great test for lower trapezius strength and mobility of the shoulder girdle. Weakness in the lower trap is a great indicator of poor scapular control during the swing and faulty body postures, such as C-Posture (Upper Crossed Syndrome). Lower trap limitations can lead to limited width in the golf swing and loss of shoulder ROM in golf posture.
Evaluation 12: Bridge with Leg Extension Test

Objective: Great test for stability in the pelvis/lumbar spine/core, especially the gluteal muscles. Glutes are the king when it comes to stability and generating power from the ground up. This test will highlight any inhibition or weakness in the glut max due to over-recruitment of the synergistic muscles, such as the hamstrings and the lower back.
Fitness Handicap: 5
Pro: Randy Jacobe

Assessment 1: Pelvic Tilt Test
Question: What is their starting Pelvic Tilt?
Answer: C-Posture
Findings: You don't have enough arch in your lower back at set up. This can put excessive stress on your lower back and limit the flexibility of your spine during the swing.
Question: How was their Amount of Movement?
Answer: Normal Pelvic Tilt.
Findings: You can perform a standing pelvic tilt which demonstrates good mobility in your lumbar spine and good control of the muscles that help position the pelvis during the golf swing. This should help you shift your pelvis into a stable position to help stabilize the large rotary force used to fire the upper body during the golf swing.
Question: What is the quality of their movement?
Answer: Smooth Motion
Findings: You demonstrated good motor control with smooth movement when asked to tilt your pelvis back and forth in golf posture. This is a good sign that you will be able to control the motion of your pelvis in the golf swing.
Program Builder

View All
Swing
Health
Fitness
Juniors
Biomechanics
Progressions

Filter
Search

1/4-1/2-3/4 Energy Drill
17 - (5',10',15')
17 - (Long Putting)
17 - Random
180 Degree Jumps with FMT
180 Degree Pivot with Discus
110 Jumps
20 Foot Star (Beat Your Height)
22 or Bust
25 Yard Rope
25-25-25
35 Yard Bear Crawls

To begin building your program drag drills & exercises here!
There are more than 26 million golfers in the United States, with an estimated 25% over the age of 65.
Most Common Amateur Golf injuries
(7,000 TPI Evaluations)

<table>
<thead>
<tr>
<th>Lower Body Part</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Back</td>
<td>28.1%</td>
</tr>
<tr>
<td>Shoulders</td>
<td>20.3%</td>
</tr>
<tr>
<td>Knees</td>
<td>17%</td>
</tr>
<tr>
<td>Hips</td>
<td>9.3%</td>
</tr>
<tr>
<td>Wrists</td>
<td>7.9%</td>
</tr>
<tr>
<td>Ankles</td>
<td>7.2%</td>
</tr>
<tr>
<td>Elbows</td>
<td>6.5%</td>
</tr>
</tbody>
</table>
1. Sprain/Strain
2. Tendinitis/Tendinosis
3. Arthritis
4. Disc Injuries
5. Tears or Fractures

- Most common cause in pro = Overuse.
- Most common cause in amateur = Mechanics.
- Injury incidence increases with chronological age.
- More than 50% of golfers will develop chronic problems.
**Tiger Woods: career injuries**

- **2010:** inflamed joint in neck
- **Mar 2, 2014:** back pain
- **Apr 1, 2014:** microdiscectomy surgery on pinched nerve in back
- **Sept 16, 2015:** second microdiscectomy surgery
- **Oct 30, 2015:** reveals "follow-up procedure" to September's surgery
- **Feb 3, 2017:** fresh back injury
- **2008-09:** tore Achilles tendon in 2008 and reinjured it several times in 2009

- **1994:** benign tumour removed
- **2002:** benign cyst removed and fluid drained
- **2007:** ruptures anterior cruciate ligament
- **2008:** surgery to clean out cartilage
- **2008:** reconstructive surgery on the damaged anterior cruciate ligament
- **Apr 26, 2011:** sprained left knee and Achilles tendon
- **May 12, 2011:** knee and Achilles flare up, calf cramp
- **Mar 11, 2012:** Achilles tendon problem
FOCUS
You must remain focused on your journey to greatness.
— Lee Br Braam

“Experienced” Golfer”
6 Most Common Lower Back Injuries

1) Sprain/strain
2) Facet Syndrome
3) Disc Pathology
4) Spinal Stenosis
5) DJD
6) Spondylololithesis

“8 times body weight compression in lumbar spine at impact and follow through”
Muscle imbalances are caused by a sedentary lifestyle; lack of a variety of movements or prolonged static postural stress due to sitting, standing, walking. Overuse leads to shortening/tightening of postural muscles. Disuse leads to weakening/inhabitation of phasic muscles.

“Lower Crossed Syndrome”

- Tight (Facilitated) Lumbar Erector Spinae
- Weak (Inhibited) Abdominal Muscles
- Weak (Inhibited) Gluteals (Gluteus Maximus, Medius and Minimus)
- Tight (Facilitated) Hip Flexors (Rectus Femoris and Iliopsoas)

“Upper Crossed Syndrome”

- Weak (Inhibited) Deep Neck Flexors
- Tight (Facilitated) Pectoralis & Sternocleidomastoid
- Tight (Facilitated) Upper Trapezius & Levator Scapulae
- Weak (Inhibited) Rhomboids, Lower Trapezius & Serratus Anterior
“The body works in an alternating pattern of stable segments connected by mobile joints. If this pattern is altered- dysfunction and compensation will occur.”
If the hip joints and thoracic spine are limited in mobility, the lumbar spine will sacrifice stability to obtain motion. **In golfers limited thoracic spine and hip mobility are two of the most common findings.**


**4 Steps to Save Your Back**

**Backswing**
- Shoulders too level increases load lumbar spine. **Right knee too straight** raises right pelvis increasing stress lumbar spine.

**Left shoulder turned down** lets T-spine rotate, not lumbar spine. **Right knee flexed** keeps pelvis level and protects lumbar spine.

**Downswing**
- No squat into right leg, hips turn but no lateral motion towards left side. Decreased power and as you swing down increases torque in lower back.

**Squat** uses powerful glutes and quadriceps power sources. Weight shift left loads left side.
Impact Finish

Too much weight on right side - using too much lumbar spine to rotate body. Lumbar spine is meant to stabilize upper torso, not turn it!

90% of weight should be on left leg, shoulders and hip level and turning towards target. Hips and pelvis do most of rotational work.

Staying in posture too long puts tremendous loads on lower back.

Thrust pelvis towards target. Let left glut and core absorb the stress. Push forward and stand up to normal standing height at finish.
Lateral Epicondylitis (Tennis Elbow) lead arm
Medial Epicondylitis (Golfers Elbow) trail arm
De Quervains Syndrome lead wrist/strong grip
Wrist flexor/extensor tendinitis hard surfaces/deep divots
Rotator Cuff Tendinitis lead arm
Patellar Tendinitis swaying/sliding
Achilles/Peroneal Tendinitis lead leg/foot rolling over
Tendinopathy- “itis vs. osis”

Tendinitis/Tenosynovitis
- Younger, acute, inflammatory.
- Rx: Rest, anti-inflammatories, splints, immobilization, US/laser, cross friction massage, stretching, strengthening, etc.

Tendinosis
- Older, chronic, degenerative, little inflammation, poor healing.
- Rx: Different animal! Frustrating for patient and clinician. Medicine and rest rarely work. Frequent re-injuries.
- New philosophy- “Load Management Rehabilitation Program” to create environment for tendon healing!
The elastic behavior of the tendons allows it to act like a spring, storing and releasing energy. Tendons were designed to be loaded. Tendons that are not loaded (rested/immobilized) become weak and more easily reinjured.

Tendons chronically exposed to high loading (tension, compression, friction) beyond their physiologic capacity can lead to injury, inflammation and a poorly healed/deconditioned tendon leading to a cycle of chronic and acute-on-chronic pain with attempts to return to activities.

Over 50% of asymptomatic patients can have abnormal ultrasound study- age related? Activity related?
Eccentric vs. Concentric Muscle Contraction

**Concentric Contraction**
“Coming up on toes”
Muscle is shortening.
Tend to be more irritating to tendon?

**Eccentric Contraction**
“Lowering heel to floor”
Muscle is lengthening.
30% more force in tendon.
Used more often in rehab-
"Painful eccentrics"
1) The pain is allowed to reach 5 on the NPRS during the activity.
2) The pain after completion of activity is allowed to reach 5 on the NPRS.
3) The pain the morning after the activity should not exceed 5 on the NPRS.
4) Pain and stiffness is not allowed to increase from week to week.
“Tyler Twist Eccentric Exercise”

TYLER TWIST

1/ Hold the FlexBar vertically with the arm that has tennis elbow.

2/ Reach across and grab the bar with the other hand, palm facing outward.

3/ Keep the injured arm still and twist the bar clockwise with the top hand.

4/ Maintain the twist while extending the arms and turning the bar horizontally.

5/ Slowly untwist the bar using only the hand of the injured arm.

REVERSE TYLER TWIST

1/ Hold the FlexBar horizontally with the arm that has golfer’s elbow.

2/ Reach over the top of the bar with the other hand. Grab and twist upward.

3/ Maintain the bar in a twisted state with both palms facing you.

4/ Extend both arms while maintaining a flexed wrist with the injured arm.

5/ Slowly untwist the bar with only the injured arm’s wrist and hand.
If you only treat the symptoms and don’t correct the mechanical problems how can you expect a good result?

*Insanity: doing the same thing over and over again and expecting different results.*

Albert Einstein
Degenerative Joint Disease

Figure 1. Anteroposterior weightbearing radiograph showing degenerative joint disease of the knee, particularly in the medial compartment.

Arthritis of the Hip Joint

normal/healthy hip joint

arthritic hip joint with worn cartilage
“X-rays look bad, patient doing well!”

Conscious Neurosensory Mapping of Internal Structures Without Anesthesia
Dye, Vaupel, Dye 1998
Soft tissues are the pain generators! Work on joint mobility including joints above and below involved joint.

- Normalize motion as much as possible.
- Stretching program for surrounding muscles and soft tissue.
- Functional joint protection strengthening/stabilization program.
- Light aerobic program- bike, treadmill, walking, swimming, etc.
- Get them moving again and surprisingly most will say they’re feeling better!
- How hard do I push??? “Stay in your envelope”
The Pathophysiology of Patellofemoral Pain
A Tissue Homeostasis Perspective
Scott F. Dye, M

Dye's Envelope of Function
Dye (2005)

Considers load, frequency and change following injury

Diagram showing different activities and their impact on load and frequency.
“Life changing experience”
Recipe for disaster!