

Golf Performance Program at Kessler Institute for Rehabilitation

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The golf swing is one of the most complex movements in sports

The entire body has to work together to produce a difficult movement requiring strength, balance, flexibility and coordination.

Causes of injury



- Amateur golfers experience injuries due to poor swing mechanics.
- Pro golfers experience overuse injuries.

GOLF-RELATED INJURIES



- There are 26 million golfers in the U.S.
- More than 36,400 people went to ER in U.S for golf-related injury in 1996.
- Estimated 25% of U.S golfers are 65+ years old.

MALE VS. FEMALE



Injuries to males usually involve the lower back.

-LBP is most common
(26-52% of complaints)

Injuries to female golfers occur in the elbow, wrist, or shoulder.

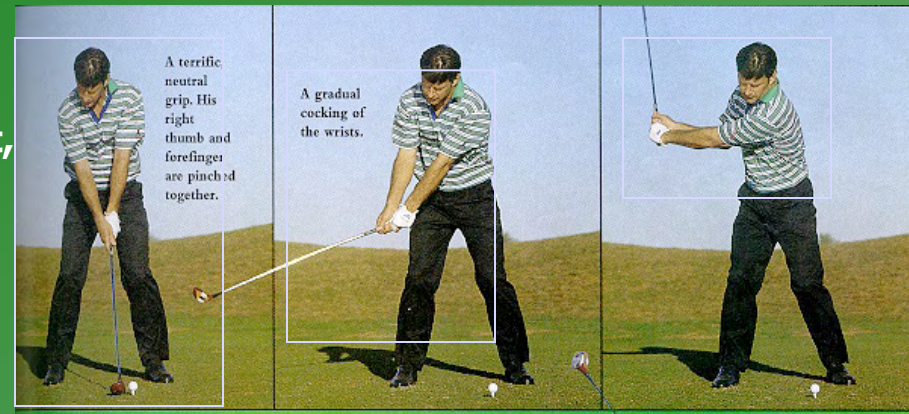
BACKtoGOLF

A Biomechanical Approach to Golf
Performance developed by Bud Ferrante,PT

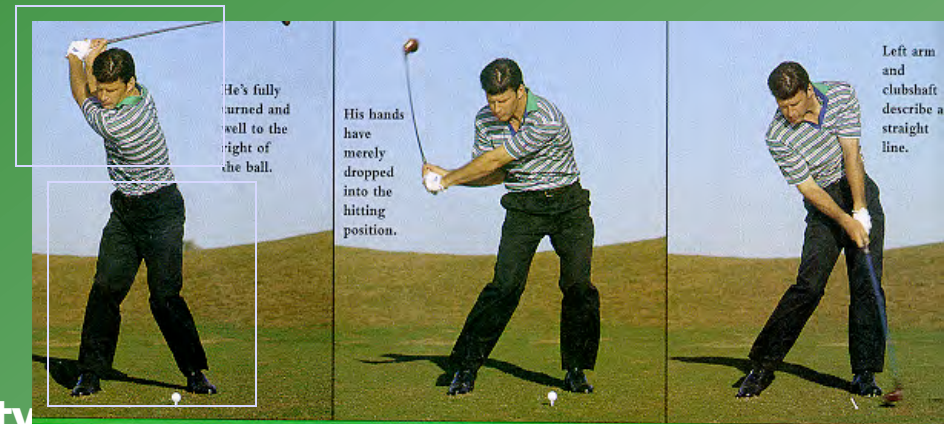
He has worked with PGA tour players-
Padraig Harrington, Tom Watson, Vijay
Singh, and Justin Leonard

BACKtoGOLF Six Step Evaluation®

- **Step One –**
 - **Address position**
 - Spine angle, Hips, Legs, Knees, Feet,
- **Step Two -**
 - **Vertical Axis of BACKSWING**
 - Hips, Legs, Feet
- **Step Three –**
- **Vertical Axis of BACKSWING**
 - Head, cervical spine on thoracic spine,
 - Thoracic/ Lumbar spine Angle
- **Step Four –**
- **Transverse Plane Bi-scapular mobility**
 - Head and shoulder relationship, thoracic spine/ribs



Step One Observation to top of swing Step two



Step Three/Four Observe movement through impact to finish position

BACKtoGOLF Six Step Evaluation

- Observe movement through the impact zone.

- Step Five
- FOLLOW-THROUGH
 - Hips, legs, feet

- Step Six
 - FOLLOW-THROUGH
 - Head, Shoulders, Spine Angle



Observe to finish

Step Five

Step Six

BACKtoGOLF Six Step Evaluation

The Grip-

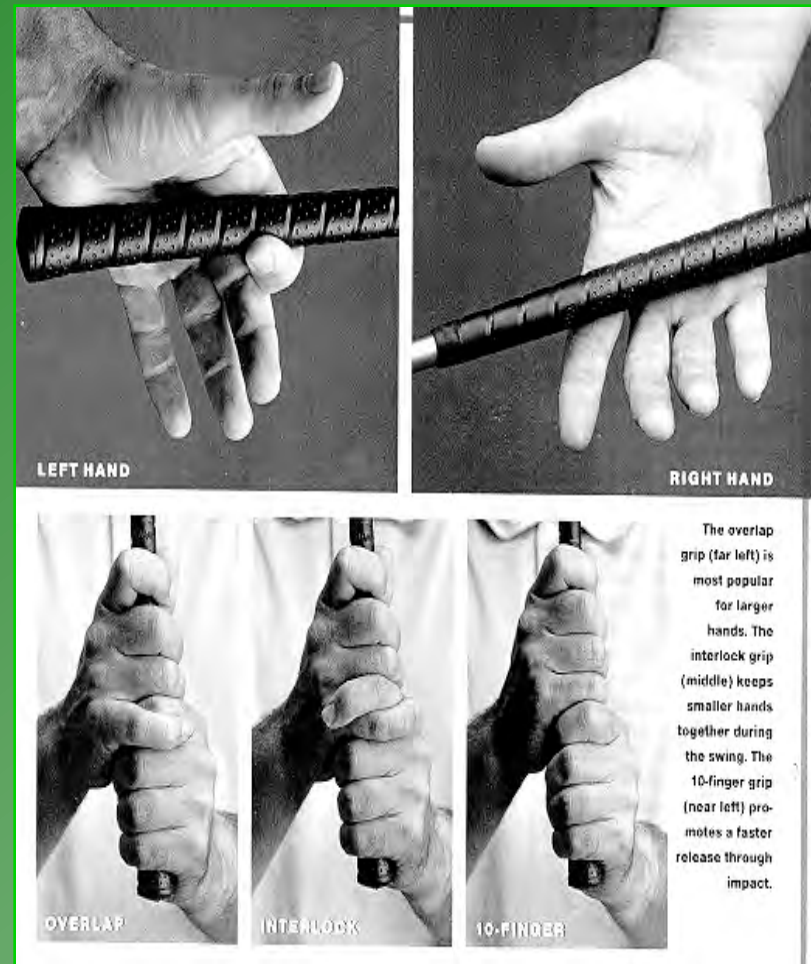
- “The Grip is the most important fundamental in golf. It must be learned correctly or the outcome of the swing will be severely limited.” Tommy Nix, PGA

L Hand contact point -

- „ Below hook of Hamate, 2nd MCP-
across joint line

R Hand contact point-

- „ Inter-thenar groove, 2nd MCP,
thumb along side of club



BACKtoGOLF Six Step Evaluation

Step One - Address

- Hips, Legs, Knees, Feet
- Spine Angle, Arms Address Position

Trunk - in Slight SB R

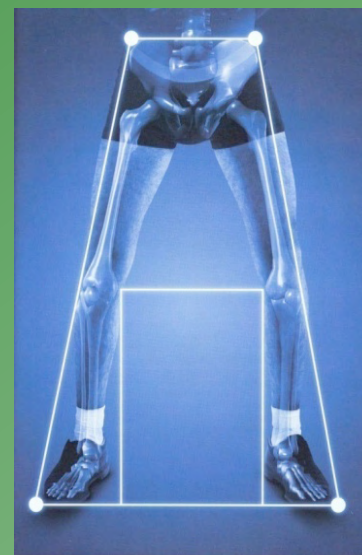
R Shoulder - slightly lower than left

Legs – ER no more than 15°

Arms - Dependent, relaxed

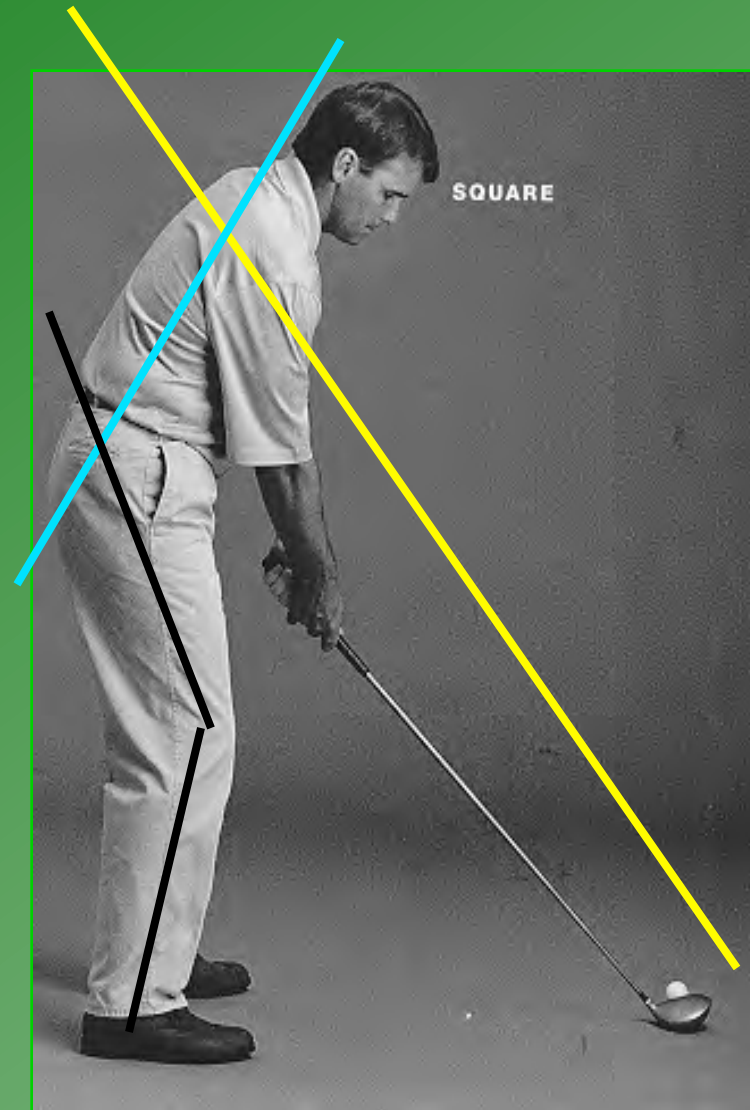
Feet - heels under shoulders,

Feet - heels shoulders width



Six Step Evaluation™ Step One

Setup - Relaxed
Head - Slight FB
Trunk – FB from hips
Shoulders – relaxed with arms
in dependent position
Hips – flexed with neutral
spine position
Knees – slightly flexed



Six Step Evaluation™

Vertical Axis of ~~Step Two~~ BACKSWING

„ Hips, Legs, Feet

Iliac crest level - L hip ABD (Fig A)

Weight shift -R leg (fig. B)

Slight drop of LEFT crest (Fig. B)

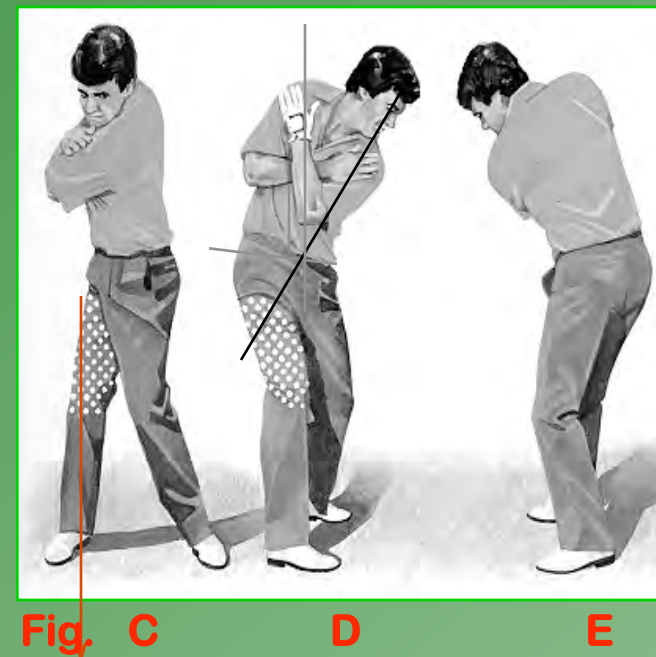
R knee flexion maintained, patella over 3-4th toe (Fig. B), tension in R thigh (Fig. C)

L knee flexed (Fig. C)

R foot flat, subtalar joint in neutral (Fig. C)

Hip rotate up to 45°, R knee at 1 o'clock position (Fig. C)

Hip-Spine Angle maintained (Fig. D)



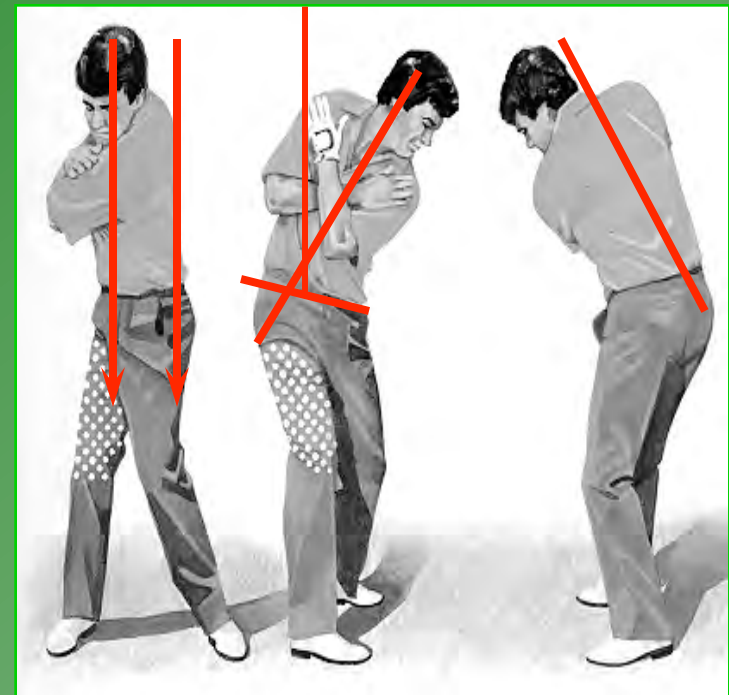
Six Step Evaluation™

Step Two_

Step Two - Backswing

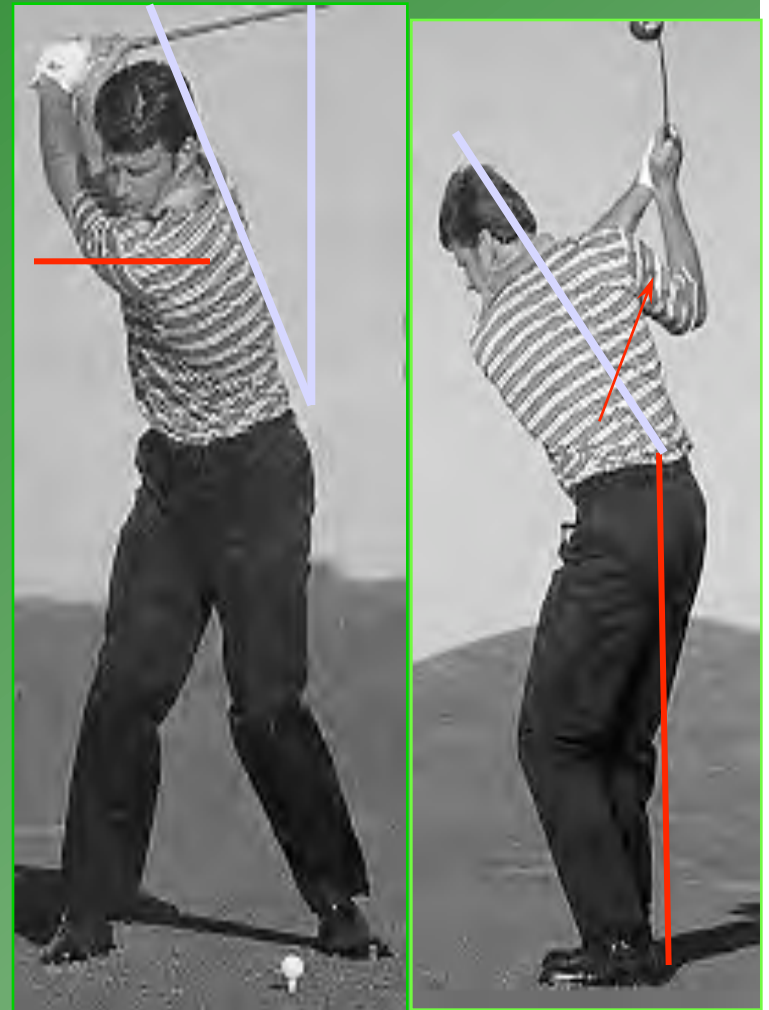
– Hips, Legs, Feet

- Observe Reaction of R Leg
 - Foot - subtalar inversion, does heel turn in?
 - Knee - Flex/Ext- able to maintain knee control – loading response
 - Leg - Abd/Flex- maintain Abd
 - Pelvic Rotation Level- Slide?
- Observe Position of L Leg
 - Hip Flex/Abd/Ext rotation
 - Knee Flex- how much flex and forward movement?
 - , Foot Position- Heel lift excessive?



Six Step Evaluation™ Step Three

- **STEP THREE - Vertical Axis of BACKSWING**
 - Thoracic/ Lumbar spine Angle
 - Head rotation, cervical spine on thoracic spine
- **Observe Changes**
 - Spine Angle-
 - Left Head Rotation
Head on Neck – does it clear the shoulder?
 - Position of Left Acromion – does it rise – indicates tight posterior shoulder
 - Left Arm Flexion- does it flex to increase backswing?
 - Right Arm Flexion – does elbow rise above 45° to increase backswing?



Six Step Evaluation™ Step Four_

Transverse Plane-

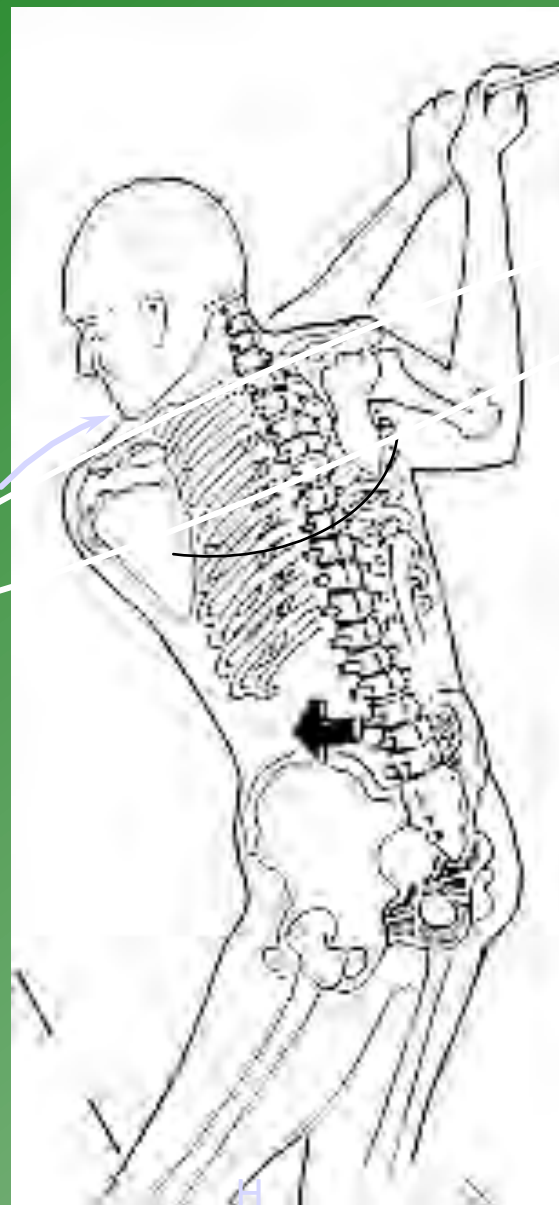
- „ Bi-scapular mobility (Fig. H)
- „ Head and shoulder relationship
- „ Thoracic spine/ribs
- „ Lumbar Spine

Cervical/ Thoracic spine in rotation L

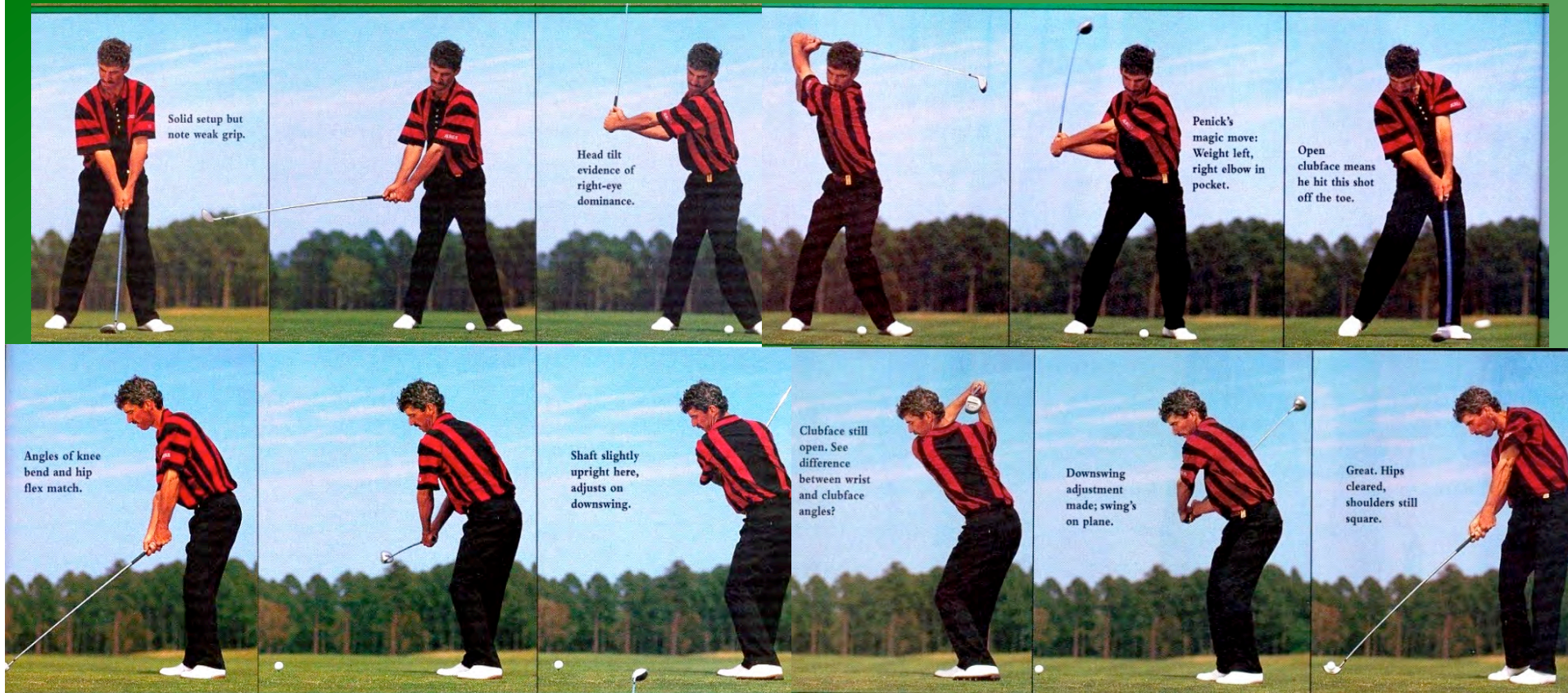
Lower Cervical/ Upper Thoracic in SB/Rot L
with mid Thoracic/ Lumbar in SB L/Rot R

Sidebending L of Thoracic/Lumbar Spine, tilt
of trunk to L to maintain weight on right lower
extremity

Arms- R shoulder 45° of ABD/ER 90°; Elbow
90°; L Shoulder IR, Elbow Ext.,
Wrists, R RadDev/Ext, L RadDev.



Spine Angle - Thoracic Rotation



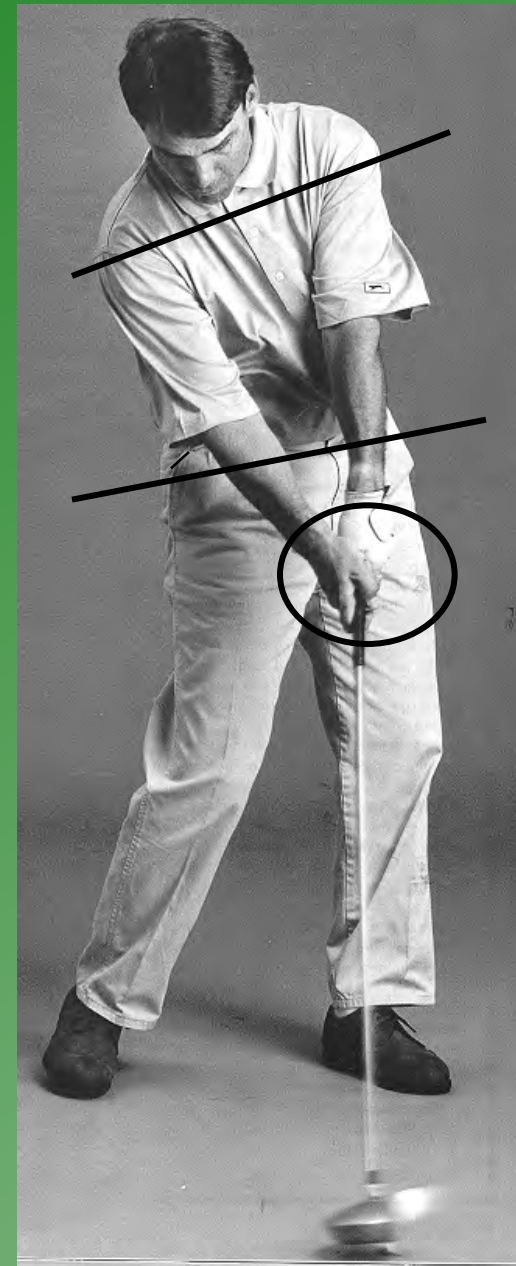
Six Step Evaluation™

Observation movement through
impact to finish

Observe movement through the
impact zone.

Hips turning slightly ahead of
shoulders, controlled sidebending
of spine. (Fig. 1)

Wrist position thru Impact (Fig. 2)



Golf Swing Faults

The differentiation of psycho-motor vs. biomechanical faults

There is a direct, intimate relationship between the two.

Biomechanical faults will produce movement compensations which the golfer then translates into the ability or inability to perform the movement.

- **The active mind takes over-**

“Hitting a golf ball is an act so precise that there is unlimited room for error. That error begins in the mind and finds expression in the swing.” Lorne Rubinstein

Biomechanical faults are a result of the inability to retain the spine angle

- **Postural compensation patterns**
- **Myofascial restrictions**
- **Reflex restriction patterns**

Common Biomechanical Full Swing Faults

- Rounded Back at Address
- Poor posture, decreased thoracic extension with loss of lumbar lordosis due to poor abdominal control, tight hamstrings, poor sense of proprioception, bifocal glasses.
- Test – Hamstring length, lumbar and thoracic extension, posture alignment, hip extension/internal rotation, “power zone” strength,
- Solution – Stretch hamstrings, spinal stabilization training, postural mobilization/thoracic extension/rotation, postural strengthening, check for single vision lenses.



Stance too Wide

Solution -

Test hip abductor and internal/external muscle strength

Ability to internally rotate hips and shift weight from right to left foot - armless swing

Iliotibial band, hip abductor and internal rotator tightness

Mobilizations -

- Hip mobilization into extension, internal rotation, adduction

Exercise -

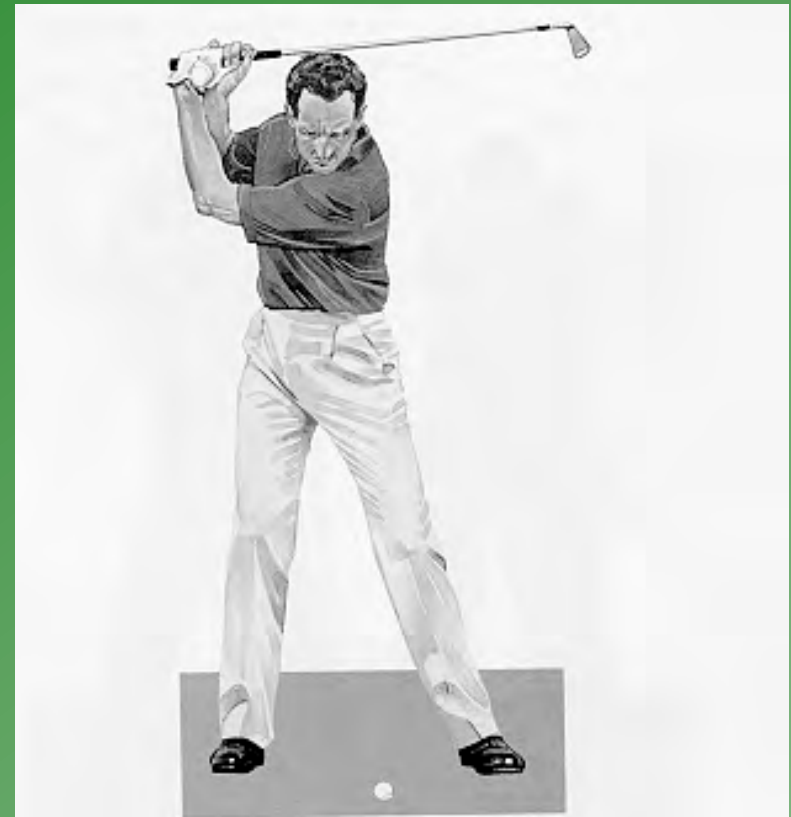
- Hip rotation drills, hip strengthening exercise for hip muscles
- Weight transfer and weight shift awareness drills



Common Biomechanical Full Swing Faults

Incomplete body turn

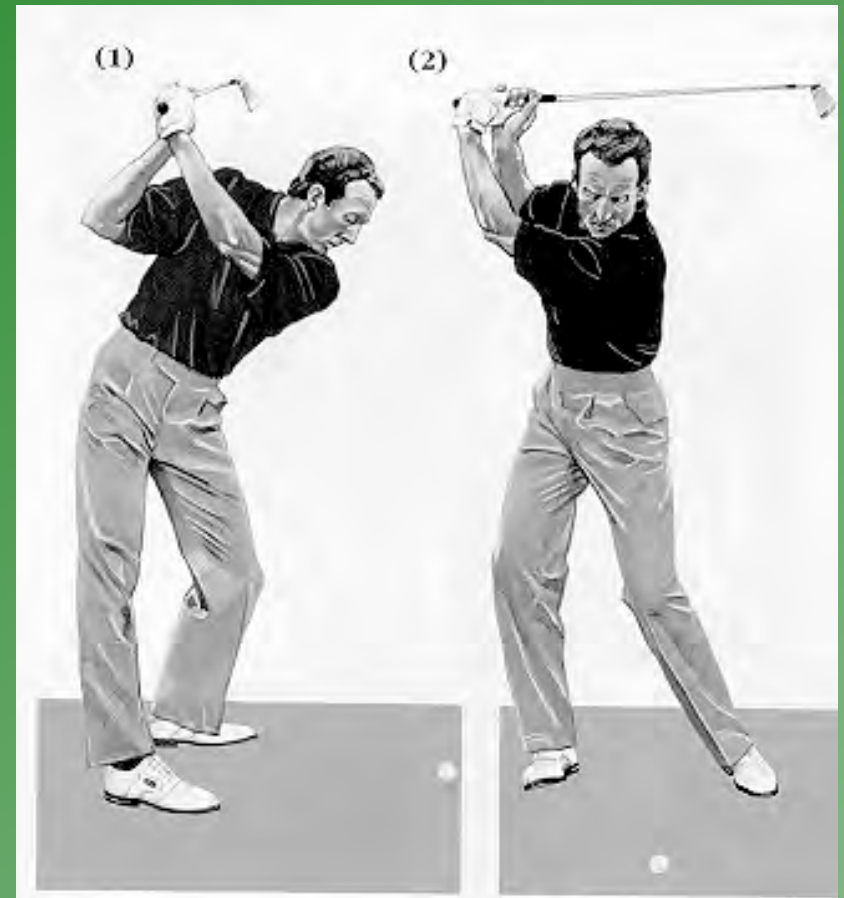
- due to tight L shoulder, trunk, weakness of hip muscles, poor balance, poor proprioception of the hips.
- Solution – Test ROM of trunk, shoulders, hips, facilitate hip rotation, rotation drills. The Swing Fan Trainer



Common Biomechanical Full Swing Faults

Right knee out of position

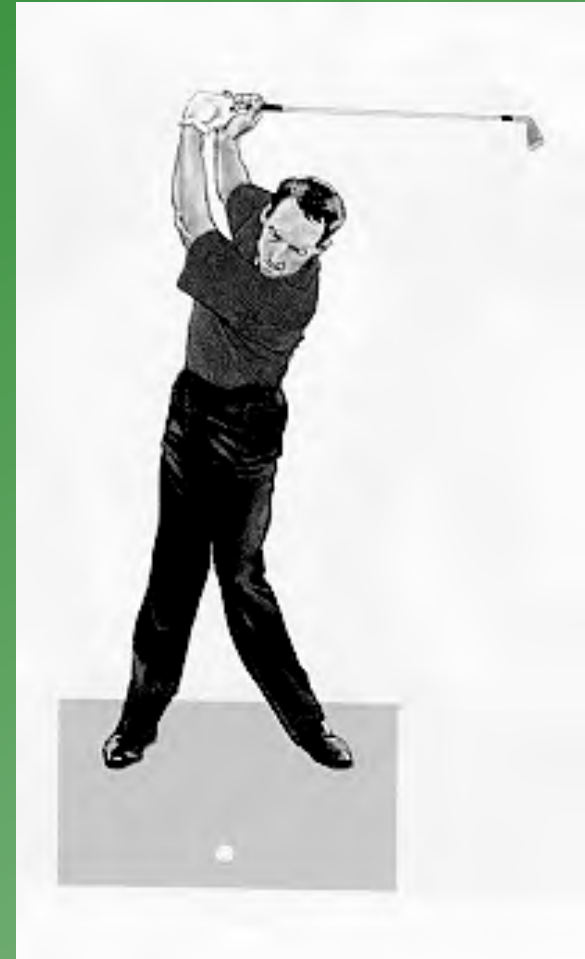
- knee goes in to extension or the femur externally rotates weight over R heel, lat foot, hips slide to right
- Tight hip tissues -
 - Internal rotation, IT band, L abductors
- weak internal rotators
- translation of spine angle
- a “thin shot” or a slice will occur due to change in swing plane



Common Biomechanical Full Swing Faults

Reverse Pivot –

- often due to poor sense of hip rotation,
- transferring of weight to left side, tight trunk or shoulders,
- lateral hip structures such as IT band, TFL, quads, hamstrings.
- Loss of spine angle - turning around a weak right side
- Tight thoracolumbar myofascial and facet joints
- Tight left adductors



Common Biomechanical Full Swing Faults

Over swinging – due to poor hip control, restricted shoulder motion - - inadequate proprioception of the hips, poor sense of body in space.

Test – muscle balance/strength

Solution – drill for rotation of left shoulder over right foot with elbow extension.

Develop sense of pushing the club away during the backswing.



Common Biomechanical Full Swing Faults—

Swinging Club in wrong Plane

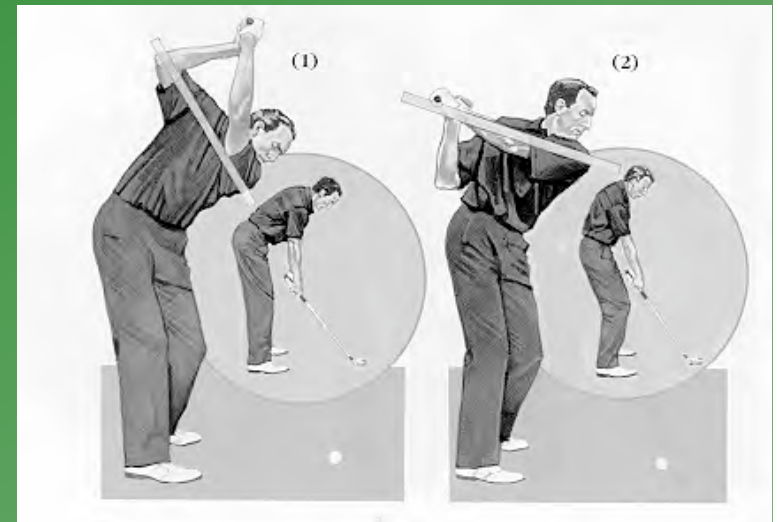
Often due to restriction of shoulder turn. Poor sense of swing plane

inability to protract the left shoulder-

- thus the club moves to the plane of least resistance, faulty posture at address.

Solution -

- Test for tissue restrictions around the shoulder, upper trap dominance, trunk rotation and hip stability and rotation.
- Check hand position during backswing to develop sense of awareness of shoulder tension and club position



Inadequate Weight Transfer

Associated with Hitting from the Top – inability to pivot to left, usually preceded by poor hip rotation and straight R knee

Commonly seen with senior golfers that may demonstrate-

- weakness of hips
- knee problems - OA, TKR
- poor sense of hip rotation
- inadequate weight transfer
- evaluate ankle, left knee stability

Test – Trunk, hip ROM,



Early Release of Club at Impact

This is the cascade of faults in the sequence of the previous two swing faults.

- hips often slide to the left then stop as the hands approach impact.
- hips slide do to poor rotation, the hands try to compensate

Solution -

- Swing Fan into impact
- Plyoball toss
- Activate hip rotation



Poor Follow-through Position with balance at Finish

Loss of

- Final result of previous swing faults
- Club does not rotate around shoulders- loss of distance and power
- Loss of balance as weight moves forward
- Flexibility and strength essential
- Tight right and left hips(left predominant)
- Tight trunk
- O/A, knees, hip weakness













7th Hole at Pebble Beach- Par 3

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