



The Golf Fitness Experts®

Toe Touch and Spine Posture Stability

A Clinical Study
Performed in Body
Balance for
Performance Centers

Hypothesis

- If a golfer is not able to touch his or her toes effectively, the golfer will have challenges maintaining spine postures in the golf swing

Background

- There are assertion that the functional motion of toe touch is related to loss of posture and other swing faults based on observation of golfers over the years.
- It is one of the Big 12 Screens and it is a part of the SFMA published and taught by the Titleist Performance Institute staff.

Background

- It was decided to study this relationship to determine if in fact there was a statistical relationship between toe touch and spine posture in the golf swing

Method

Subjects:

We worked with regional golf associations and country clubs to solicit for participants in this research project.

There were a total of 100 subjects tested and reported on in this presentation.

Total of 350 in the sample, but did not have time to do the stats for this presentation

Method

- Physical Testing
 - A Toe Touch Test was administered in the standard fashion as instructed by the TPI Staff in their Level One course.
 - Subjects were asked to stand erect with their heels and toes touching
 - They were then asked to keep their knees straight and bend over attempting to touch their toes

Toe Touch Test - Fail



Toe Touch Test – Pass



Methods

- Physical Testing
 - Three attempts were made by each subject
 - All data recorded was pass/fail.
 - If they were able to touch the toes, then they were given a grade of PASS.
 - If not, then they were given a grade of FAIL.

Methods

- Swing Testing
 - Study used the Body Motion System.
 - System is a 3-D motion testing system.
 - Procedure
 - Golfers were asked if they use steel or graphite clubs.
 - Golfers were given an 8 iron with the shaft type that was steel or graphite based on their answer to the initial question.

Methods

- Swing Testing
 - The Body Motion System was applied to the golfer so that the upper sensor was at the scapular spine centrally on the spinous processes. The lower sensor was applied centrally on the sacrum at S2.
 - The system was then calibrated to the student in the standard protocol as describe in the Body Motion System Documentation

Methods

- Swing Testing
 - Students were in doors for testing of their swing.
 - They were instructed to hit 5 golf balls.
 - Five consecutive swings were recorded for this study.

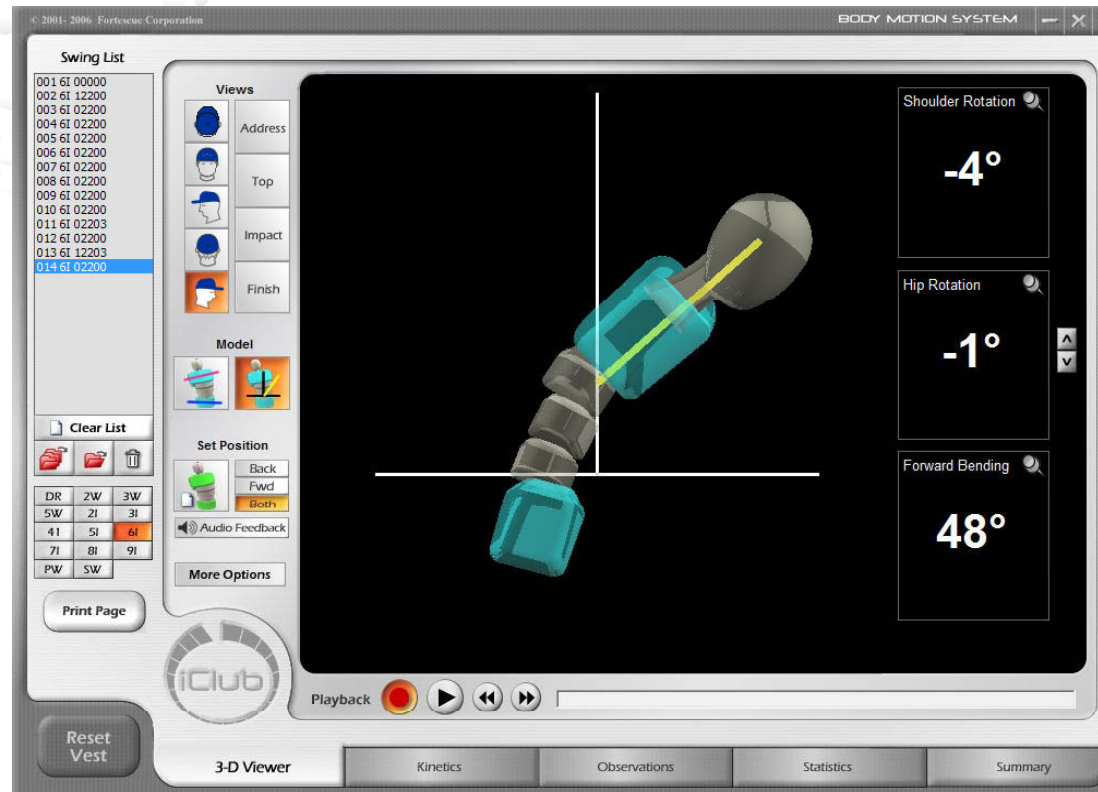
Methods

- Data Collected from the BMS
 - A measurement called forward bend was collected at set-up, top of the back swing, impact, and finish.
 - Forward bend on this system was measured as the angle of the torso relative to the vertical (the line from the thoracic sensor to the sacral sensor).

Methods

- The plane of measurement of this angle is the plane created by the saggital plane of the body at set up through the golf ball. The plane is the same at all points in the swing.
- We decided to measure body movement against stable cardinal planes because this measurement was most similar to what golf professional look at when they look at spine angle.

Setup Spine Posture Measurement



Spine Posture Measurement - Top

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Swing List

- 001 6i 00000
- 002 6i 12200
- 003 6i 02200
- 004 6i 02200
- 005 6i 02200
- 006 6i 02200
- 007 6i 02200
- 008 6i 02200
- 009 6i 02200
- 010 6i 02200
- 011 6i 02203
- 012 6i 02200
- 013 6i 12203
- 014 6i 02200

Clear List

DR	2W	3W
5W	2i	3i
4i	5i	6i
7i	8i	9i
PW	SW	

Print Page

Reset Vest

Views

- Address
- Top
- Impact
- Finish

Model

- Back
- Fwd
- Both

Audio Feedback

More Options

3-D Viewer

Shoulder Rotation: **-96°**

Hip Rotation: **-44°**

Forward Bending: **45°**

Playback

Kinetics Observations Statistics Summary

Spine Posture Measurement - Impact

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Swing List

- 001 GI 00000
- 002 GI 12200
- 003 GI 02200
- 004 GI 02200
- 005 GI 02200
- 006 GI 02200
- 007 GI 02200
- 008 GI 02200
- 009 GI 02200
- 010 GI 02200
- 011 GI 02203
- 012 GI 02200
- 013 GI 12203
- 014 GI 02200

Clear List

DR	2W	3W
5W	2i	3i
4i	5i	6i
7i	8i	9i
PW	SW	

Print Page

Reset Vest

Views

- Address
- Top
- Impact
- Finish

Model

- Model 1
- Model 2

Set Position

- Back
- Fwd
- Both

Audio Feedback

More Options

3-D Viewer

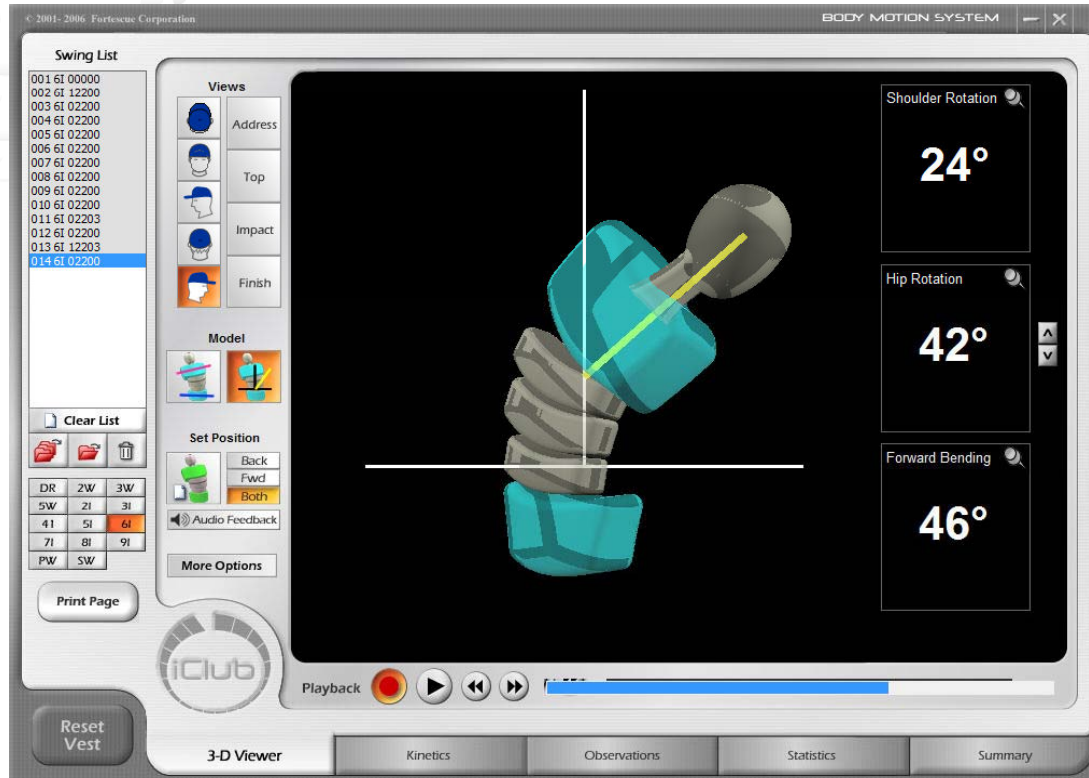
Shoulder Rotation: 24°

Hip Rotation: 42°

Forward Bending: 46°

Playback

Kinetics Observations Statistics Summary



Data and Results

- The forward bend at impact was 34.6 for those that failed the toe touch test
- The forward bend at impact was 45.4 for those that passed the toe touch test.
- The forward bend at finish was 28.6 degrees for those that passed the toe touch test.
- The forward bend at finish was 18.7 degrees for those that failed the test.
- $p < .05$: this means that the differences are statistically significant

Data Interpretation

- It appears that a failed toe touch test leads to deviations away from stable spine postures (based on golf instructors' designation of ideal)
- Toe touch test's 3 major issues:
 - Hamstring flexibility
 - Hip hinge mobility
 - Pelvic and core stability
- That means that the preliminary data from this study supports the hypothesis that lack of hamstring flexibility, hip mobility or core stability lead to variances in spine postures in the golf swing with a high degree of certainty.
- Database expansion is planned until we have 500 subjects in the study. We expect to have that complete by the end of 2008.

Toe Touch Correction

- Assess the components of Toe Touch
- Correct tightness with manual therapies, stretching and glute/abdominal/hip flexor re-education
- Correct Hip hinge mechanics with Toe Touch sequences and Leg Lowering activities

Conclusions

- If a student has poor hamstring flexibility, hip mobility, or core and pelvic stability you might want to consider having those issues resolved through the help of a body expert.
- The medical literature suggests that these physical issues are related to back and hip pain.
- If the student does not want to deal with those issues it could challenge the student's ability to master spine stability and all that is affected by poor trunk stability. That could lead to inability for the golfer to consistently find the center of the club face.

Further Research Needed.

- Is there a specific cause of failed toe touch that is more or less related to the results of this study?
- Increase the size of the database for added validity.
- Does this data have impact on ball flight?