

# **QINOperactic Medicine and Peak performance in Golfers**

## **Can QINOperactic treatment influence professional golfers performance?**

**This is a free translation of the original study that was made and written in Swedish.**

Translated to English by the performer of the study, Dr Mike Dahlstrom on  
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## **Abstract**

Different types of back problems, including muscular imbalances that lead to incorrect biomechanics, are a constant problem for golfers today.

Researchers at Stanford University School of Medicine found a clear correlation between bad swing biomechanics and injury. It goes so far as to say that this is the most common cause of injury in golfers.

We want to find the answer to whether there is a correlation between reduced muscular stability in the pelvis/hip region and lower back and the performance of a golf swing and whether this can be improved with QINOpractic treatment.

The result is quite striking. On average, the speed of the golfball as it left the head of the club increased by as much as 9.5 Mph which can be compared with other leading studies / tests that indicate an improvement of 2.2 Mph.

A 9.5 Mph increase means an improvement of 6.6% for women and 7.6% for men. In addition, the golfers experienced a 37% improvement in the "flow" in the swing and accuracy. The general feeling in the body after the treatments increased by as much as 40% and the stiffness in the body was reduced by 58%.

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## 1:1 Introduction

Different types of back problems are a constant problem for athletes today

The term back problems include both pain itself but primarily muscular imbalances in the core muscles and the pelvis region. A Muscular imbalance of the core (and pelvis) muscles is devastating for today's well-trained golfers.

Core stability represents an important part of body control. Adequate core stability enables the muscles to develop enough strength to optimize muscular function and coordination.

Good core stability is the prerequisite so that muscles and joints can perform in a safe, powerful and effective way.

Optimum core stability requires that many factors fall into place:

- Ability to maintain the spine in the correct position throughout the range of motion
- Ability to control the rotation of the whole body and in a way coordinated fashion
- Strong stabilizers, primarily the core muscles, in combination with ample movement in both upper and lower extremities.

The physical and mental status of a golfer is the basis for what conditions he / she has to carry out the different movements and thus its performance / results.

Today, golf courses are longer and require greater and greater demands on elite golfer on many levels, physically and mentally. It's not enough to just be a good technician in order to survive as a professional athlete today.

Today it requires a lot more of the elite golfer than 15 years ago and it looks like the future will require an even greater demand on the golfers strength, flexibility, balance AND mental state..

Researchers at Stanford University School of Medicine found a clear correlation between a bad swing biomechanics and injury. They go as far as to claim that this is the most common cause of injury in golfers. Their study shows that 26-52% of golf-related complaint is lower back injury, 6-10% has shoulder pain, and 13-36% has wrist injuries. <sup>1</sup>

But unfortunately it's not as easy as just practice more and more, you also have to take into account a huge amount of factors that are more difficult to "train";

- Do the brain have ample connection with the muscle you're working out? (Brain - muscle connection)
- Can the right stabilizers and antagonists interact with the agonist, i.e. is the muscle coordination between the muscles groups optimal?
- How does muscle and coordination function under stress and how do improve these factors?
- How can you maintain proper body strength and balance outside the treatment room?
- How do you know that the person you hire for your physical (and mental) training actually knows their "stuff"?

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<sup>1</sup> Study of golf swings pinpoints biomechanical differences between pros and amateurs

We want with this study to demonstrate that in an increasingly demanding environment of today's golfers, we also need a rethink the treatment for these future stars.

## **1:2 Problem Areas**

The subjects (golfer) functional performance is very extensive and complex in a pain-free body, but how is the performance affected if pain is involved?

Or fear of pain or that you possibly could re-injure an old injury?

Is there a direct correlation between pain and decreased performance? Logically, this relationship should apply; existing pain should result in reduced function and thus performance. What about fear of pain? Could this also lead to impaired function? If we turn the reasoning; can a muscular dysfunction (i.e. imbalance) lead to pain? Is there a correlation between muscular imbalances and impaired performance in conjunction with a golf swing?

Poor mobility and flexibility, improper movement patterns, poor core stability and impaired proprioception probably result in reduced function of the golf swing and thus performance.

## **1:3 Purpose**

The purpose of this study is to examine whether there is a correlation between an impaired muscular stability in the pelvis and lumbar region and performance in a golf swing.

Furthermore, we want to test whether a right / left brain hemisphere balancing also improves the swing.

## **1:4 Questions**

In order enable the answering of the purpose we have chosen the following questions:

1, Can we QINOpactic Medicine Treatment and Neurological Calibration demonstrate a direct correlation between improved core stability and an improved golf swing, and if there is a connection with an improved core stability and performance.

2, Will the participants notice anything different in their body or their overall performance after the treatment and how do they think/feel this will affect their golf.

## **1:5 Method and methodology discussion**

The study was executed during 2 weeks at Ullna Golf Club under the supervision of staff from the same. Ullna Golf Club selected four golf players (test subjects) based on the criteria we had set up:

- 1, Professional and experienced golfers who recognizes their swing.
- 2, 2 male and 2 female golfers
- 3, All participants in the study has to know their body well and feel any change in the body and their movement when things are not ok.
- 4, All participants has to be pain and injury-free at the time of the start of the study.

### **Procedure at testing session** (read more at point 3:1)

The subjects began by warming up by stretching and hitting approximately 20 balls in the indoor hall. After warm up, the test subject hit 8 golf balls from the same platform. During these 8 strokes, the ball speed (the speed of the ball as it was hit by the club). The speed was measured by a laser.

An average score was then calculated from these 8 strokes (the best and worst score was discarded), this was the measurement No. 1.

The actual measurement was performed by personnel from Ullna Golf Club.

In addition, they filled out a self-perceived perception on a VAS scale of 1-10.

Read more about this scale in section 3:2.

Then, the subjects rested for about 20 minutes, no activity or food intake was made during this interim period.

After the break, the treatment session started with a Neurological Calibration, after which they were instructed to go back and forth for 30 seconds inside the treatment room.

Immediately thereafter we checked the core muscles (kinesiological muscle testing) and pelvic muscles we have chosen include in this study and possibly treat:

Erector Spinae, Quadratus Lumborum, Gluteus Medius and Maximus, Rectus Abdominis and Obliques Internus and Externus.

Weaknesses were recorded and then treated with QINOpactic Medicine.

After the treatment, all weak muscles were re-tested and if all were strong, the test person once again walks back and forth in the treatment room for another 30 seconds.

After the complete treatment session, the test subjects once again went into the golf hall and performed the same procedure as before: Stretching (if necessary), hitting 20 balls and then 8 strokes while ball speed was measured once again and the same VAS scale was filled out.

All measurements were managed by Ullna Golf Club. We were never inside the training hall during this part. We stayed either inside the treatment room or in the entrance hall. The input of data into the computer was handled by us, but Ullna Golf Club has the original response forms.

## **1:5:1 Method Discussion**

For this specific study, we chose a clinical based approach, because we think it is the best and easiest way to conduct the study, and find out the result of the study immediately.

A literature study was out of the question, because there is no one else in the world that can perform a QINOPractic treatments other than us and our students. (Since we founded the treatment method)

We were never inside the golf hall when the test subjects hit the golf balls, to make sure that our mere presence didn't altered the result. We don't know how this would've affected the results but we wanted to remove this parameter in any case.

We only performed the actual treatment and wasn't informed about the results from test round no. 1 before the treatment.

All treatments were performed by Dr Mike Dahlstrom, doctor of Chiropractic and founder of QINOPractic Medicine. All participants participated voluntarily and received no reimbursement for their participation in this study.

## **1:6 Limitations**

In our study, we have chosen to limit the number of muscles that we feel are the most important when it comes to core stability and a stable pelvic region: Erector Spinae, Quadratus Lumborum, Gluteus Medius and Maximus, Rectus Abdominis and Obliquus Internus and Externus.

We've chosen to only include physical parameters, such as muscle strength and coordination and some mental aspects. We have not taken into account the following factors:

### **1:6:1 Mental Aspects**

We've included some mental issues the test subject had in this study (that involved their golf). We are well aware that mental aspects are of paramount importance (outside the golf itself as well), but we have excluded these (external) factors in this study.

### **1:6:2 Nutritional aspects**

Nutritional aspects are an extremely important part of the whole for today's elite athletes. But we have absolutely no idea if and how nutrition has any affects a golf swing. We've excluded this factor.

### **1:6:3 Previous injuries**

This is an aspect that is difficult to ignore. All participants in this study had to be pain-free at the start of the study, but how earlier injury, or fear to re-injure an old injury affected the test subjects performance is unclear. We have not included in this pilot study.

### **1:7 Criticism of the study**

This study is a pilot study has some shortcomings:

1, All treatments has been with both QINOpactic therapy and Neurological Calibration. Since we treated with both techniques at every session, we don't know which of technique gave the best results. We need to perform a larger study with more participants and separate treatment protocols to evaluate this.

2, We tried to provide identical conditions in the two test rounds, but this is extremely difficult. We chose to have 20 minutes of rest for the participants to "cool" down and not be warmed up before testing round 2.

Before test session no. 2, subjects received 2 treatments, were they still warm just by this?

Maybe we should've had 30 or 60 minutes between the test sessions or maybe we would have treated after 20 minutes and then allowed the subjects to wait another 20 minutes before testing round 2.

The subjects were instructed to feel "as warmed up" before round two as they were before round one.

3, Home exercises. We are well aware of the need for home exercises and an individualized exercise program based on their specific muscular imbalance. But during the time for this study, no such instructions were provided, they were instructed to go about their lives as usual, don't change their routines.

4, Pain, or fear of pain. One can't ignore facts like pain (that we excluded from this study). Pain plays a major part of our movement patterns. Did they experience pain or discomfort? Were they afraid of the pain? How did this pain or fear affect their movement pattern?

5, Control group. We elected in this pilot study not to use a control group. Perhaps we should've had one, but because we believe that the first round is a form of control group, so we opted out of this to this particular element in this study. In a larger study, we would have a control group as well. The layout of this larger study may look a little different; 1, the subject does nothing at all between times, or 2, the subject perform a couple jump squats before the test session 2 (hitting golf balls), to replicate by Miller in 2012.

(J Strength Cond Res. 2012 Sep 21. The Effects of Post Activation Potentiation on Golf Club Head Speed. Read P, Miller SC, Turner AN.)

6, Size and length of the study. Our pilot study included only four subjects. In a future, we would like to do a larger study, and for a longer period of time. In this study, test subjects would be divided into two groups, those following our training program and those who received no training instructions at all.

## 1:8 Definitions

In this study, there are concepts, techniques and terms that may need clarifications. Some components are not mentioned in the work itself, but is nonetheless imperative for to understand of the overall picture; the complexity required for coordination and proper muscle recruitment, for example, the tonic neck reflexes. In this section is an account of some aspects / techniques used in this study, or others that are important as an underlying understanding.

### 1:8:1 Tonic Neck Reflexes

In the upper neck region, the deep neck reflexes receptors are located. They immensely affect our capability to perceive our world, with proprioception. In these muscles, large number of muscle spindles per gram (up to 10 times more than in the extremities) are present. This means that distorted afferent information leads to inaccurate efferent reflex response signal. This dysfunction in afferent information will affect our whole perception of motor skills and coordination, which in turn leads to incorrect information to distal joint (e.g. knees) receptors.

The tonic reflexes respond to flexion, extension and rotation of the cervical spine. According to Walther, the following relationship for the tonic neck reflexes<sup>1</sup>:

Motion in the neck	Reflex
Flexion	Flexion of the upper limb and extension of the lower extremity
Extension	Extension in the upper limb and flexion of the lower
Rotation	Extension and abduction of unilateral limb, and flexion and abduction of the contralateral limb

This reflex is present at birth, but declines with age, but it never disappears completely

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<sup>1</sup> Walther, s. 306

### **1:8:2 Cervicocephalic kinesthesia**

Ability to detect the heads position in space

Depends on three components; Eye orientation, Vestibular system of inner ear and proprioception from distal receptors.

Information from these components is sent to a “higher court”, the Cerebellum, where data is processed and from this information out body perceive the heads position in the room.

See also the section 2:2, the postural system.

### **1:8:3 Pain**

With the word pain we mean subjective pain experienced by the patient. Many have tried to define the phenomenon of pain, one example is: "Pain is an unpleasant and emotional experience. It is caused by actual or potential tissue damage, threatening or as interpreted by the person." The Swedish medical report (SBU) states that it's not possible to measure the actual pain, because it's based on subjective experiences<sup>1</sup>.

### **1:8:4 Muscle Testing**

In order to assess the strength of the muscles we have chosen to work with kinesiological muscle testing to determine this.

Kinesiological muscle testing originates from two Physio Therapists; Kendall and Kendall.

Kinesiological muscle testing differs from Neurological muscle testing used by Neurologists to find abnormalities in their diagnosis of Neurological Diseases.

We then go on by defining what QINOpactic Medicine and Neurological Calibration (synchronization of the two brain hemispheres) means.

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<sup>1</sup> SBU report, page 301

## **2:1 Back ground**

It is not long ago that elite golfers had no direct influence as athlete role models. Many were severely overweight and consumed their fair share of alcohol and other substances.

A gigantic revolution has occurred in golf and first and foremost professional golfers. The new trend with very well-trained athletes was started by Tiger Woods and his entrance on the golf scene. Tiger was very well trained, hit longer and straighter than everyone else, in addition he could train twice as much as others since he had a very good physique.

Since then, the vast majority of elite golfers have begun to focus more on their strength training, taking it to a completely new level than before.

Today, most professional golfers have their own personal trainers, hitting coaches and some use mental coaches as well.

Training outside the golf course has become a necessity for today's elite golfers. Most golfers know that a good basic physique and general agility are the basis on which they can practice their sport at the very highest level.

Personal trainers and other staff around the elite golfer have a much greater impact on their golfers' performance than they are given credit for. Without a personal trainer, many would be injured and unable to support themselves by their sport.

In a study from 2012, the authors state that the test subjects swung the club faster after several vertical jumps! One can only speculate as to why this happened, but the result was that this did happen (an increase of 2.25 Mph was measured).

The question is how much the test subjects' expectations affected the result.

Different parts of the body are loaded/stressed during the golf swing itself:

In the recovery phase, stability is required in the lower part of the body to be able to rotate up to the desired position.

At the top, in the turn itself, more strength and stability in the upper body is required.

After the turn, the descent should start with the hips. This also requires enormous strength in the torso stability to be able to extract the necessary force and explosiveness.

In order to maintain the correct movement and explosiveness throughout the swing, it is important that you can accelerate throughout the stroke, otherwise, there is a risk that the point of impact either come too soon or too late, or not with enough power.

If the golfer is unable to generate enough power, he/she is then forced to use the upper body and arms too much, resulting in injuries in these areas.

In addition, the tempo is of the utmost importance. If you wait to turn on the power (close to the ball), your hands and club-head could be too far forward. A late "switching on" also makes it easier for you to over-rotate in the transverse plane.

The brain is the organ that controls this activation and deactivation of different muscle groups so that you can perform this very complicated movement pattern.

If for some reason the brain cannot perform this coordination of movement, the swing will be negatively affected, and, the body will have to compensate, resulting in an incorrect

movement pattern with reduced ability and pain as a result.

## Muscular imbalance - What is it and how does it affect the golf swing?

Muscular balance or imbalance in the body refers to symmetry, including side to side, front and back, and rotational symmetry. For the muscles to be able to perform these changes in direction, there must be a good balance and coordination. This balance is created by a relationship between length, strength, ability to coordinate, and a well-functioning nervous system.

Muscular balancing is about balancing these factors.

In general, you should be sure that you:

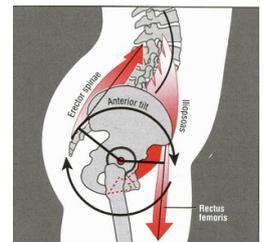
- Have an optimal strength (and length) ratio between the middle / lower Trapezius and Pectoralis Major.
- Has optimal strength (and length) ratio between Hip flexor (Psoas) and hip extensor (Gluteus Maximus).
- Has an optimal strength (and length) ratio between the Adductors and the Gluteus Medius.
- Has adequate mobility in the spine and a well-developed ability to coordinate.

Unfortunately, most of us do not have these conditions both in everyday life and/or in our sports, which always leads to pain or injuries.

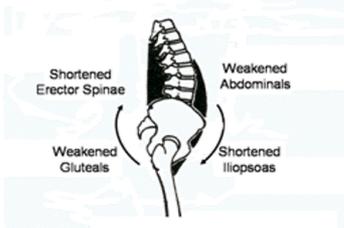
Try to imagine that you have stronger, and shorter muscles on one side of the body and distinctly weaker muscles on the other side. This will "pull" your spine obliquely, your hips and other joints are positioned in an unfavorable starting position when they are used (and in rest). This is a reality in our bodies, but the mismatch is in a muscular imbalance between the front and the back.

Often, this imbalance begins in a muscular imbalance between the hip flexor (Psoas) and the hip extensor (Gluteus Maximus) where the former is stronger and shorter than the latter.

This in turn lead to that other muscles (synergists) have to learn to compensate for the prevailing imbalance, we now have a muscular imbalance.



This imbalance will negatively affect the swing and your general condition. But it's even more complicated than that. We as QINOPractic Medicine practitioners have our own theory/philosophy about where the fault lies. We will now present 2 reasons that we believe are the basis for not only a deteriorating golf swing but pain in the back as a whole. The brain must have contact with the muscle



**The brain must have contact with the muscle in order to activate it optimally.**

If you have a lamp that is attached to a wall socket with an on/off button on the cord.

If you press the on/off button, the lamp lights up. But what happens if you pull the plug out of the wall socket and then do the same procedure - press the on/off button? The light doesn't go on. If electricity doesn't have contact with the lamp, it cannot light up. Not that strange.

Even if you manages to direct all of a nuclear power-plants electricity to the wall socket, the lamp would still not light up.

We, QINOpactic practitioners, believe that this is exactly how it works in our bodies as well. If the brain does not have contact, or in most cases, not enough adequate contact, with the muscle, it can't perform as it should.

True, with a lot of training you can achieve a basic strength in the muscle, but that is not enough for the happy amateur or the elite golfers, such as day 3 or 4 in a golf tournament. QINOpactic is about enabling this contact so that the brain has adequate contact and is able to contract enough Actin and Myosin filaments in the torso stability muscles for example.

### **The two brain hemispheres must cooperate.**

In trauma, stress, and at high concentration, communication between the right and left hemispheres can be impaired. For a golfer, this is catastrophic.

The left hemisphere stands for the logical, analytic, and mathematical part, the one that knows how far it is to the hole, how the wind blows, how the green slop, how the stans and grip should be.

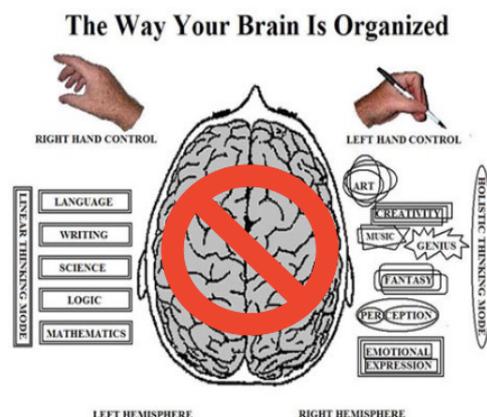
All of this is controlled from your left hemisphere.

The other half of the brain, the right one organizes the rhythm, balance, coordination for instance. What happens if the right and left parts of the brain can not work together when you stand at the 18:th tee, day 4, with a good chance of winning?

For some reason (usually mental) you just can't seem to find the right feeling in your body. You start over but still can't get the feeling.

The right and left hemispheres of the brain cannot communicate adequately.

We believe that these two steps must be corrected in order for an optimal swing to take place.



After this basic underlying philosophies we talk about Our postural system, including a details explanation what:

Proprioception

Receptors around our joints and mechanoreceptors are

Receptors in soft tissue

Muscle spindle cells

Golgi Tendons are

This is fairly boring for the average reader, so I haven't bothered to translate it.

### **3.1 Test procedur / Test method**

In this section, I will give you a detailed description of how the test procedure was performed during the three test sessions. The test subjects start by warming up by stretching and hitting 20 balls in the indoor hall.

Each participant had to choose the club that it would use, this club was then used during all test sessions.

After the warm-up, the test person hit 8 golf balls from the same platform, then the test persons measured via a laser, the speed that the ball left at impact, when it left the club. Then the test subjects filled in a VAS scale (Visual Analogue Scale) about how they experienced their feeling in the body during and after the test round and then they sat down in the entrance cafe/lobby and rested for about 20 minutes.

No activity or food intake was allowed during this intermediate period.

They were instructed to sit down and take it easy.

After rest, they were first given a Neurological Calibration treatment, after which they were instructed to walk back and forth for 30 seconds inside the treatment room. Immediately afterward, the torso stability muscles and the core stability muscles we selected to examine and possibly treat were examined (Erector Spinae, Quadratus Lumborum, Gluteus Medius and Maximus, Rectus Abdominis and Obliquus Internus and Externus).

Weaknesses were registered and then treated with QINOpractic Medicine.

After the treatment, all weak muscles were tested again and if everyone was strong, the test person was again allowed to walk around inside the treatment room for 30 seconds.

After this treatment section, the test subjects went out into the hall again and performed the same procedure as before: stretching (if necessary) hitting 20 balls, and then 8 balls where the same parameters were measured again. Then a second observation about the feeling in the body of the VAS scale (note they did not see the previous score when they filled out the

second one).

### **3: 2 Measurement method**

At each round (two per day) the test persons measured via a laser, the speed that the ball left at impact i.e. when it left the club.

The highest and lowest score was disregarded and an average was calculated of the remaining 6 scores/strokes.

The measurement was performed by staff from Ullna Golf Club.

In addition, the test objects had to fill in a self-perceived feeling on a VAS scale from 1-10.

### **3: 3 VAS scale**

After each test round, the subjects had to fill in a self-perceived feeling in some categories.

The categories assessed were: Stiffness, Fluency in the swing, Precision in stroke, Pain, Discomfort, General feeling in the body.

The scale was rated 1 to 10.

1 was the worst result and 10 the best.

See the definitions under each heading.

Pain and discomfort had an inverse scale, where 1 was the best, eg painless and 10 very painful.

#### **3: 3: 1 Stiffness**

Here the test persons self-assessed the stiffness in the body. VAS 1 was very stiff, even restricted mobility VAS 10 is absolutely no stiffness experienced during the test session.

#### **3: 3: 2 Fluency in the swing**

Here the test person self-assessed how they experience the flow or fluency in the swing during the test sessions. VAS 1 was no flow at all VAS 10 was a wonderful flow and rhythm in the movement during the test session.

#### **3: 3: 3 Accuracy at impact**

Here the test persons self-assessed how they experience the accuracy as the club struck the ball. VAS 1 was a bad club/ball-impact. VAS 10 was an enormously good ball hit during the test session.

#### **3: 3: 4 General feel in the body**

Here the test persons self-assessed how they perceive their general feeling during the test session. VAS 1 meant that they experience a very bad general feeling in the body.

VAS 10 meant that they experience a very pleasant feeling in the body.

#### **3: 3: 5 Pain**

Here the test subjects self-assessed whether they experienced pain during the test round.

VAS 1 - no pain at all, VAS 10 - a lot of pain

### **3: 3: 6 General Discomfort**

Here the test subjects self-assessed if they experience discomfort (not pain) during the test round.

VAS 1 - no discomfort was perceived at all.

VAS 10 - a lot of discomfort is present, but below the pain threshold

All measurement and filling in of the VAS scale was handled by Ullna Golfklubb. We were never in the test part of the indoor hall during this part. We were only inside the treatment room or in the hallway. Input into the computer was handled by us, but Ullna Golfklubb has the original on the forms.

### **3: 4 Test results**

During a short period in the spring of 2013 (3 weeks in April), we conducted measurements on professional golfers selected by Ullna Golf Club. We will name them test person 1-4.

No. 1 and 2 are a women, 3 and 4 are men. All golfers perform their sport professionally.

We wanted to know 2 parameters: 1, Did the test subjects hit longer after the treatment and 2, Is there a difference in the subject's self-assessed perception of how the body functioned after the treatment.

#### 4: 1 Summary of results

Although this was a small study and for a short period we can see a lot of promising trends. We will analyze each individual test person and in the end do a larger evaluation and analysis.

#### Result summary: Test person number 1 (woman 25 years)

Test person 1						
VAS scale	Driver					
	1;1	1;2	2;1	2;2	3;1	3;2
Stiffness	6	7	8	10	7	10
Fluency in the swing	6	7	7	7	7	7
Accuracy at impact	5	7	7	8	7	8
General feel in the body	7	7	9	10	8	10
Pain 1 = No Pain	2	2	2	1	1	1
General Discomfort 1= bad	2	2	2	1	2	1
Discomfort in her hip, old injury						

Ball speed	1;1	1;2	2;1	2;2	3;1	3;2
1	105	121	120	124	110	123
2	127	126	131	131	133	132
3	109	124	121	124	127	127
4	126	126	128	126	122	128
5	117	123	126	129	127	128
6	121	125	120	129	123	128
7	123	124	130	125	129	127
8	124	122	125	128	126	128
Average - best/lowest disregarded	120,0	124	125	126,8	125,7	127,7

Difference between test 1,1 and 3,2

7,7 mph

The test person clearly noticed her injury in the hip, but after the treatment it got better, both in the stiffness and in the general feeling in the body.

The pain and discomfort also improved, albeit rather marginally (2 to 1).

Here we can see a clear improvement: between test rounds 1; 1 and 3; 2, the test person has increased his tee speed by 7.7 Mph or a 6% improvement. This means a distinct difference in length.

More than a 5% increase in speed is remarkable, especially after only 3 treatment sessions and no home exercises or instructions at all.

**Test person number 2 (woman 22 years)**

Test person 2						
VAS scale	Driver					
	1;1	1;2	2;1	2;2	3;1	3;2
Stiffness	6	9	8	9	8	10
Fluency in the swing	6	8	7	8	8	9
Accuracy at impact	6	8	6	9	7	8
General feel in the body	5	9	7	6	8	9
Pain 1 = No Pain	3	2	3	2	2	1
General Discomfort 1= bad	4	3	3	7	4	2
	Had some tea in between and felt nauseous					

	Driver					
Ball speed	1;1	1;2	2;1	2;2	3;1	3;2
1	109	122	128	129	120	126
2	125	132	123	124	112	134
3	119	127	127	124	127	127
4	119	125	128	126	128	126
5	120	127	125	125	120	128
6	121	124	127	125	125	126
7	119	128	124	124	128	126
8	123	123	125	124	123	126
<b>Average - best/lowest disregarded</b>	<b>120,2</b>	<b>125,7</b>	<b>126,0</b>	<b>124,7</b>	<b>125,2</b>	<b>126,5</b>

Difference between test 1,1 and 3,2

6,3 mph

This test person also had pain for some time, this time in one shoulder.

Test person number 2 also has a clear improvement on all self-assessed feeling in the body (34%), even though she felt unwell before round 2; 2.

If she had not experienced this discomfort, the measurement would have been even better, according to the test person herself.

Despite the nausea, test person 2 felt that the stiffness, flow in the swing, pain and accuracy were better than in round 2: 1. However, the general feeling in the body and the discomfort during the swing got worse.

As a whole, the difference between test rounds 1: 1 and 3: 2 is significant, for example, the test person did not experience any pain during the test sessions, something that the test person herself was surprised by. This had been a recurring problem for many years.

**Test person number 3 (man 29 years)**

Test person 3						
VAS scale	Driver					
	1;1	1;2	2;1	2;2	3;1	3;2
Stiffness	6	10	9	10	8	10
Fluency in the swing	6	9	8	9	8	10
Accuracy at impact	7	8	7	9	7	9
General feel in the body	6	9	7	9	8	10
Pain 1 = No Pain	1	1	2	1	1	1
General Discomfort 1= bad	3	1	4	1	2	1
	Felt that the general feeling in the body was the most important					

	Driver					
<b>Ball speed</b>	1;1	1;2	2;1	2;2	3;1	3;2
1	134	140	144	142	146	149
2	147	148	148	150	153	161
3	140	142	146	147	147	150
4	136	140	144	149	147	150
5	138	139	144	149	150	150
6	138	142	146	147	150	151
7	137	140	147	147	151	155
8	138	140	145	147	149	153
<b>Average - best/lowest disregarded</b>	137,8	140,5	145,3	147,7	149,0	151,5

Difference between test 1,1 and 3,2

13,7 mph

Test person number 3 felt a huge difference between before and after the treatments. "General feeling in the body is much more important than the improvement in length", test person 3 considered (40% improvement)

We see here a clear improvement partly within the same test round (1; 1 and 1; 2) but also as a whole.

Stiffness 6 to 10 (40%) is a significant difference, as is an improvement in the swing of the stroke and the general feeling in the swing.

The test person had no pain in the body, but a certain indefinable discomfort that was significant improved by the treatments.

Here we see a significant improvement in the result, as much as 13.7 Mph or a whopping 9% improvement in the impact.

A huge difference, but as I said, the most important thing for the test person was the distinct improvement in the general feeling in the body after the treatments.

**Test person number 4 (man 38 years)**

Test person 4						
VAS scale	Driver					
	1;1	1;2	2;1	2;2	3;1	3;2
Stiffness	6	9	5	9	6	9
Fluency in the swing	6	10	6	8	5	8
Accuracy at impact	6	8	5	8	5	9
General feel in the body	7	9	6	9	6	9
Pain 1 = No Pain	2	2	5	1	3	1
General Discomfort 1= bad	1	1	3	1	3	1
	Experienced an incredible energy in the body after the treatments					

	Driver					
<b>Ball speed</b>	1;1	1;2	2;1	2;2	3;1	3;2
1	145	148	149	159	160	160
2	157	157	154	150	149	151
3	149	152	150	150	150	152
4	150	157	151	151	151	152
5	148	150	149	156	149	154
6	152	153	151	152	150	156
7	151	153	152	154	150	156
8	150	153	150	152	151	155
<b>Average - best/lowest disregarded</b>	150,0	153,0	150,5	152,5	150,2	154,2

Difference between test 1,1 and 3,2

4,2 mph

This test person also thought that by far the biggest and most important thing that happened with the treatments was the feeling that he felt afterward (22% improvement).

This test person felt a huge surge in energy in the body after the treatments and could not understand how this happened, but repeated time and time again what a wonderful feeling he experienced, both when he just "was normal" and at in the feel of the swing (flow/fluency in the swing - 25% better)

Here, too, we can see a big difference in the speed at impact, but it would probably have been even better if the test person had not focused so much on feeling such a wonderful energy in the body. The improvement was 4.2 Mph or 2.7%.

## 5:1 Analysis

A pilot study of if a QINOpactic Medicine treatment can affect golfers' performance  
All test subjects experienced distinct improvements in the self-assessed part (VAS scale) that had to do with their subjective assessment.

This part is not so scientific but we simply have to trust that they made as fair an assessment as possible. They were very serious in their answers and they did not get to see their previously filled out results before filling in the form after test-round 2.

The average of the different sections was:

	From - to	Improvement %
Stiffness	6 to 9,8	40 % improvement
Fluency in the swing	6 to 8,5	30 % improvement
Accuracy at impact	6 to 8,5	30 % improvement
General feel in the body	6,25 to 9,5	30 % improvement
Pain (1 = No pain)	2 down to 1	100 % improvement
General Discomfort	2,5 down to 1,3 *	100 % improvement

\* Note: One test person felt unwell and experienced discomfort (7) during the test round (2; 2)

The improvement in ball speed at the moment of impact was:

	From - to	Increase	Improvement %
Testperson 1	120 to 127,7	7,7 mph	6 % improvement
Testperson 2	120,2 to 126,5	6,3 mph	5 % improvement
Testperson 3	137,5 to 151,5	13,7 mph	9 % improvement
Testperson 4	150 to 154,2	4,2 mph	2,7 % improvement

Average gender:

Increase ladies		7 mph	5,5 % improvement
Increase men		8,95 mph	5,85 % improvement

A 5 Mph increase in speed is considered by the participants in this study to be a significant difference and could mean that they would cut the score. After completing the tests, we can state that the increase was as much as 8.95 Mph for men and 7 Mph for ladies.

The results and analysis of this pilot study are quite unambiguous: Treatment with (synchronizing the two brain hemispheres (Neurological Calibration and QINOPractic Medicine treatment improves the self-assessed feeling and General feel in the body. All test subjects experienced a very positive feeling and harmony in the body, partly when they were "just normal" and when they completed test round 2 in the session.

The golfers reported a 30% improvement in the Fluency in the swing and Accuracy at impact. The general feeling in the body after the treatments increased by as much as 30% and the stiffness in the body was experienced as much as 40% better.

The results of the study were contaminated by the fact that one participant felt unwell in test round 2, which may have affected the results. We considered redoing this test round, but realized that this would not be fair to the results of the study.

### **6: 1 Conclusion:**

It is quite clear that the treatments offer the golfer a significant improvement, but a larger study would be needed and performed over a longer period of time.

There are many good studies on techniques and training programs that can improve golfers' (at all levels) performance. For example, Miller\* showed that the test subjects swung the club faster after a number of vertical jumps! An average improvement of 2.25 Mph was measured. Our pilot study shows even better results than this study, our improvements were as high as 7.98 Mph (7 Mph for women and 8.95 Mph for men).

A remarkable difference that looks promising for the professional golfer, as well as for the happy amateur who just wants to improve his/her results.

A common thread through all the results is the participants' self-assessed perception of how well their bodies functioned and felt. All participants were surprised at how well they "felt" in the body after each treatment. Improvement in the flow/fluency of the swing, accuracy at impact, and the general feeling in the body after the treatments increased by 30% and the stiffness in the body was experienced as much as 40% better.

All of these improvements are significant and should have a positive impact on all golfers' results. Bear in mind that we did not give the golfers any home exercises or advice regarding our findings, they were instructed to change nothing during the duration of the study.

The purpose of the study was to examine whether there is a correlation between reduced muscular stability in the pelvis and core muscles and the performance of the golf swing. Undoubtedly there is such a correlation, but larger studies are needed that also take into account mental aspects and the golfer's everyday life, incl training outside the golf course.

\*1 J Strength Cond Res. 2012 Sep 21. The Effects of Post Activation Potentiation on Golf Club Head Speed. Read P, Miller SC, Turner AN.