

An introduction to

CORE STABILITY

injury free performance



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FROM THE EDITOR

These days you only need to have stepped your big toe over the threshold of the local gym to have heard all about the importance of core stability. In fact over the past 10 to 15 years this training concept has probably been more influential than any other training approach or marketing gimmick in breathing new life into the business of fitness and physical conditioning. It has fed the extraordinary growth in popularity of Pilates, and it has enabled us all to make connections between underlying fitness and high performance, injury avoidance, effective rehab and the reduction or cure of many every-day low-level pains and sources of physical discomfort.

So it feels as though a special report on the subject from the Peak Performance stable is well overdue. Well, here it is. We may have made you wait, but I think you'll find the results worthwhile. Our specialist sports therapists on PP's sister publication Sports Injury Bulletin boast an impressive set of credentials and this collection represents the cream of their theoretical and working knowledge. I've deliberately included some of the slightly more technical physiotherapy material because I believe it offers really useful insights as to how sports therapists approach their work with clients. Everything in this report has highly practical relevance, right down to the invaluable set of training menus specially designed by our resident conditioning coach Raph Brandon, which take up the latter section of the report. This is as close as it gets to a body conditioning toolkit. I hope you get pleasure and good use from it.



Jane Taylor
Editor, Sports Injury Bulletin

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CORE STABILITY INJURY FREE PERFORMANCE

A SPECIAL REPORT FROM SPORTS INJURY BULLETIN – ARTICLE ONE

Sitting down for long periods each day is not natural and the longer it goes on the more problems are likely to develop. These are a few of the issues that can arise; reduced extension in the lower back, stiffness in the mid thoracic spine, tight/weak muscles at the back of the shoulders and hunched shoulders and tightness in the external hip rotator muscles.

It is important therefore to educate ourselves and integrate this into our daily lives.

PILATES:

The corner stone of pilates is the concept of core-stability. To have a stable trunk, is the best platform from which to develop whole body muscular strength and endurance, balance and flexibility.

The six main principles of Pilates are, concentration, control, centring, conscious breathing, core alignment and co-ordination.

As there are many different types of Pilates and differing class sizes, care must be taken on two key fronts accuracy and specificity.

- **Key One – Accuracy** – This relates to how fitness pilates is taught, the environment the size of the class and how much one to one training is available (which is essential for prevention of injury).
- **Key Two – Specificity** – This relates to what is being taught. The greater the specificity the greater the chance of success.

Pilates must be performed with attention to detail – it is only then that the participant will see long term benefits.

SWISS BALL RESEARCH

Evidence to support the efficiency of Swiss Ball research comes from a Canadian Laboratory working with electromyographic activity. EMG (electromyographic) activity finds the Swiss Ball to be most effective for abdominal muscles. In research carried out it compares it to various abdominal and core exercises to carry our tests of effectiveness.

However when tested for usefulness for the quadriceps, it showed that it inhibited the prime mover muscles during the activity. In essence the Swiss ball turns the movement into a stability proprioception exercise rather than a limb strengthening exercise.

Mcgill (also from Canadian research team) has found that spinal loads are greater on unstable surfaces compared to sitting on a chair and therefore does not endorse replacing a chair with a Swiss ball at home or in the office. Strengthening of the core muscles can be done in a different and less precarious way.

CORE STABILITY INJURY FREE PERFORMANCE

A SPECIAL REPORT FROM SPORTS INJURY BULLETIN – ARTICLE TWO

BODY SUPPORT SLINGS AND CORE STRENGTH

Body Support Slings can develop Significant Core Strength

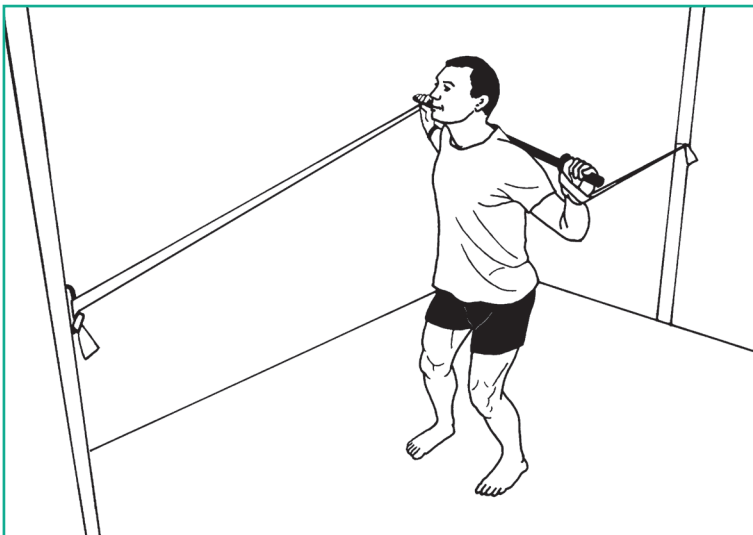
The concept of myofascial slings comes out of the work done by Andre Vleeming and others on sacro iliac joint (SIJ) stability.

Here are some of its key training principles

- Stay upright
- Work in Neutral
- Learn to contract stomach muscles

Correct Training Technique must be used with the myofascial sling

- The exercise is performed standing up
- Bend slightly at the knee
- Adopt a slightly leaning forward position with a gentle forward pelvic tilt
- There is trunk resistance against resistance which activates the side stomach muscles
- The broom stick sits on the shoulders and is pulled into the shoulders to help secure the stability of the posterior oblique sling.



EXERCISE PROGRAMMES

NB// Before carrying out these exercises it is recommended that you read the full Sports Injury Bulletin report on Core Stability, so that you have detailed back ground on technique

Note that one full repetition of this exercise involves rotating from x degrees backward trunk rotation to x degrees forward rotation and then returning to the backward start point.

BEGINNERS

- Use a single band
- Mover through a small range of rotation 10 degrees to 10 degrees each direction (total arch of 20 degrees)
- Perform 3 sets of 10 reps each direction (band at left, then band at right)

INTERMEDIATE

- Use two bands, one either side of the broomstick
- Rotate through 20 degrees to 20 degrees
- Perform 3 sets of 10 reps in each direction

ADVANCED

- Can double up number of bands (or more, and/or use tougher bands etc.), depending on your rotation strength
- Extend range of rotation up to 45 degrees to 45 degrees
- Perform 3 sets of 10 reps in each direction

WEAK GLUTEALS CAN RUIN THE RUNNER

During running you are always either completely in the air or dynamically balanced on one leg – and in both circumstances gluteus medius is a key muscle.

Adaptations to weak gluteus medius in stance phase

Adaptations	Areas at risk
1. Trendelenburg (Heavy tilting of the pelvis)	Lumbar spine, sacro- iliac joint (SIJ), greater trochanter bursa, insertion of muscle on greater trochanter, over activity of piriformis and tensor fascia latae (TFL)
2. Medial knee drift	Compression of lateral tibiofemoral compartment (outer side of knee), knee joint, patellar tendon and fat pad, pes anserinus, iliotibial band (ITB)
3. Lateral knee drift	Compression of the medial tibiofemoral compartment (inner edge of knee), ITB, postero-lateral compartment, popliteus
4. Same sided shift of trunk	Lumbar spine (increased disc and facet joint compression), SIJ (increased shear)

Adaptations 2 and 3 clearly cannot occur together, but a runner's technique may demonstrate a combination of adaptations, such as a mild Trendelenburg, inwards knee drift and a same-sided trunk shift.

A highly informative study by Fredericson (2000) upholds the idea that gluteus medius weakness is a contributing factor in ITB friction syndrome; confirms the injured and uninjured sides can be compared to determine weakness; and endorses retraining for strength gains as an effective treatment.

Two exercises to build gluteal medius strength are

- The Clam
- Side lying leg raise

CORE STABILITY INJURY FREE PERFORMANCE

A SPECIAL REPORT FROM SPORTS INJURY BULLETIN – ARTICLE THREE

CORE STABILITY TRAINING MENUS

There are three major groups of exercises:

Those focusing on getting the small deep lying stabilising muscles (such as lower abdominals and deep spinal muscles) to work properly. These exercises are often taken from clinical Pilates

Static body weight exercises that concentrate on developing stability and/or strength endurance in certain postures. These need you to learn how simultaneously to work your small stabiliser muscles and larger mobiliser muscles.

Traditional dynamic strength exercises for the main movement muscles of the trunk, often performed on the floor or Swiss ball.

PROGRESSIVE OVER LOAD AND WHAT IT MEANS

Progressive overload is one of the key principles of training. You start off exercising at a low and manageable level. After a certain time your body adapts, so you can then increase the dosage to produce further increases in fitness. If there is no progression then your fitness level will plateau.

The outlined core stability menus below are detailed fully in the Sports Injury Bulletin Special report:

MENU 1: FLOOR STATIC

This menu aims to develop a basic level of lumbar and pelvic stability, working front, rear and side muscles of the trunk. This menu is intermediate to advanced.

- **The Plank** – Muscles targeted – Rectus abdominis, Abdominal wall
- **The Gluteal Bridge** – Muscles targeted – gluteus maximus, erector spinae/multifidus
- **'Bird dog' or 'Superman'** – Muscles targeted – Thoracic and lumbar portions of erector spinae

MENU 2: FLOOR DYNAMIC

This menu aims to develop a good level of strength endurance in the major trunk muscles. This menu is intermediate to advanced

- **Active Straight Leg Raise** – Muscles targeted – Rectus abdominis, abdominal wall, hip flexors
- **Oblique Crunch** – Muscles targeted – rectus abdominis oblique
- **Side Lying Hip Abduction** – Muscles targeted – gluteus medius
- **Lying Windscreen Wipers** – Muscles targeted – rectus abdominis, obliques

MENU 3: SWISS BALL, STATIC

This menu challenges your ability to hold good posture and pelvic alignment against both body weight and the instability of the Swiss Ball. Over all this menu is intermediate.

- **Swiss Ball Sit and Leg Lift** – abdominal wall (transverse abdominis, internal obliques)
- **Supine Swiss Ball Bridge** – gluteals, hamstrings, erector spinae, abdominals obliques
- **Swiss Ball Gluteal Bridge** – gluteals, erector spinae, abdominals obliques
- **Swiss Ball Plank** – abdominals

MENU 4: SWISS BALL, DYNAMIC

This menu targets the front, back and side of the trunk musculature at intermediate to advanced level.

- **Swiss Ball back Extension** – erector spinae, lumbar and thoracic portions
- **Swiss Ball Overhead Pulls** – abdominals, latissimus dorsi, pectorals, scapular stability muscles
- **Swiss Ball Squat Thrust** – abdominals
- **Swiss Ball Side Crunch** – Intermediate Level – Obliques

MENU 5: PULLEY, KNEELING

This menu uses the pulley system which allows us to treat trunk training like limb training, working at higher resistance levels as your strength improves. Overall these exercises are advanced.

- **Chop Rotation** – Functional to many sports and daily life activities – abdominals, obliques (plus upper body)
- **Lift Rotation** – The opposite to the chop rotation – erector spinae, obliques, (plus upper body)
- **Pulley Crunch** – abdominals

MENU 6: PULLEY, STANDING

This menu challenges pelvic stability during unilateral standing upper body movements. Research has shown that unilateral exercises increase the recruitment of the core musculature. The resistance load on the arm is secondary to the stability challenge of the core.

- **Rear Sling** – establishes perfect pelvic alignment – abdominal wall, adductors, gluteus medius
- **Front Sling** – opposite to the rear sling – abdominal wall, adductors, gluteus medius
- **One Leg, One Arm Rowing** – abdominal wall, adductors, gluteus medius

MENU 7: MEDICINE BALL, FLOOR

It is important to use a medicine ball that will allow you to perform these exercises with good technique. If the ball is too heavy you will sacrifice core stability, irrespective of your arm strength. Over all these exercises are advanced. However they are safe and effective for young athletes using light medicine balls to develop trunk movement and control.

- **Sit Up and Throw** – advanced version of the sit up – abdominals, (plus upper body)
- **45 Degree Sit, Catch and Pass** – erector spinae, abdominals, obliques
- **Sit and Twist Pass** – abdominals, obliques
- **Kneeling Twist Pass** – Obliques

MENU 8: MEDICINE BALL, STANDING

The aim of this menu is to perform trunk movements while standing on one leg. These are advanced exercises for the trunk and also use engage the hip rotators and abductor muscles for control and stability.

- **One Leg Twist Pass** – gluteus medius, piriformis, abdominal wall, oblique
- **One Leg Dead lifts with Rotation** – erector spinae, gluteals, hamstrings, piriformis
- **One Leg Catch and Pass** – all muscles used!!

MENU 9: RESISTANCE BASED

The aim of these exercises is to progress the loading in order to build high level trunk muscles strength. As you get stronger you should increase the weight not the number of reps performed. These exercises are advanced

- **Crunch with Weight** – abdominals
- **Reverse Hypers** – erector spinae, gluteals
- **Reverse Crunch with Weight** – abdominals, obliques

MENU 10: HANGING BAR

These exercises are very advanced and work work the abdominals with gymnastic style movements. Reasonable upper body strength is required.

- **Hanging Leg Lifts** – abdominals, obliques, hip flexors
- **Windscreen Wipers** – abdominals, obliques, hip flexors
- **Candlesticks** – abdominals, obliques, hip flexors

CORE STABILITY TRAINING – 33% DISCOUNT FOR READERS OF ‘AN INTRODUCTION TO CORE STABILITY’

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New exercise tips, techniques & training routines that boost your body’s core strength and stamina
Core stability is an essential determinant of success for all sports people, be they cyclists, runners or swimmers, football or rugby players, golfers or rowers. That’s because the body’s core muscles are the foundation for all other movement.

The biggest benefit of core training is to develop functional fitness– that is, fitness that is essential to both daily living and regular activities. However, training the muscles of the core also corrects postural imbalances that can lead to injuries. Indeed, core stability is now seen as an essential attribute for any player who seeks to keep their chances of sports injury to the absolute minimum.

Training for Core Stability is another of Sports Injury Bulletin’s practical workbooks. It brings together, in one informative 86-page report, the conclusions of recent evidence-based research into the building of core stability for sports-people – how best to build core body strength and stamina, then how to maintain and use it to best effect. The recommended retail price of this invaluable training tool is \$59.99. But through our special online offer, you can get all the incredible secrets for only \$39.99! You save 33%! www.sportsinjurybulletin.com/core

Order your copy of this new report today and use these new training insights to build new levels of core stability and strength:

- How can you actively counteract the effects on your levels of core stability of your largely sedentary day job?
- Core Stability training strategies – what are the exercises that every athlete should consider building into their regular conditioning programs?
- Pilates is an increasingly popular form of core stability conditioning – but done incorrectly it poses the risk of chronic injury. How sure are you that your Pilates instructor knows the right methods?
- Which core stability training exercises are best done with a Swiss Ball – and which should be avoided?
- What’s the best way to train your low back and pelvis for maximum core stability?
- How can you improve your running performance simply by strengthening your butt muscles?
- Swimmers: what’s the link between core stability and shoulder injury – and what practical steps can you take to avoid future problems?

What’s more, you get free postage & packing. And you’ve got 30 days to decide whether or not you want to keep the book or return it for a full refund.

Given the growing understanding amongst athletes of the fundamental importance of core stability, this practical work book is sure to be of great interest to a wide range of people. So do make sure you order your copy today as our print run is limited.

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