

The Core Workout

A Definitive Guide to Swiss Ball Training for Athletes, Coaches & Fitness Professionals

Fourth Edition

Joanne Elphinston & Paul Pook



Chichester, England

Preface

5

Core Stability for Sport and Conditioning

6

What is Core Stability?

6

How Can Core Stability Improve

My Performance?

7

How Do I Train for Core Stability?

8

The Core Muscles

9

Upper Body Stability

12

The Swiss Ball

15

Equipment Guidelines

15

Basic Guidelines

16

Neutral Alignment

16

Stomach Scooping

18

Power Zones

20

Mental Cues

21

Breathing

22

Pain

22

Warm-up and Cool-down

22

Common Errors

23

Back Arching

23

Shoulder Hitching

23

Chin Poking

24

Knees Deviating Inwards

24

Hip Flexing

25

Back Sagging

25

Stomach Protruding

26

Form is Everything!

26

Safety Check and Medical History

27

Progression of Exercises

28

Base of Support

29

Planes of Movement

31

Length of Lever

34

Other Progression Methods

35

Getting Started

36

1. Seated Arm Raise

36

2. Single Leg Raise

38

3. Combination Lift

38

4. Ab Exploration

39

5. Neutral Bounce

40

Creating a Programme

41

Key Elements

42

1. Superman

44

2. Wall Squat

46

3. Wall Push-up

48

4. Floor Bridge

53

5. Suspension Bridge

55

6. Over the Top

56

Library of Exercises

58

1. Titanic

59

2. Walkout

60

3. Sway

61

4. Single Leg Suspension Bridge

62

5. Ham Sandwich

64

6. Hamstring Pull

65

7. Ball Stability Curl

66

8. Around the World

67

9. Pendulum Roll

68

10. Arm Stabiliser

69

11. Tricep Test

70

12. Windmill

71

13. Body Spin

72

14. Ramp

73

15. Ball Squat Thrust

74

16. Ab Burner

75

17. Caterpillar

76

Skill Builders

1. Mogul Squat
2. 4-3-2 Point Balance
3. Balance Challenge
4. Wrestle
5. Slap Hands on the Ball
6. Sport Specific Drills
7. Ballistic Push-ups
8. Walk the Walk
9. Handspring
10. Twisting Spring
11. Sprinter
12. Pullover
13. Kickout

Double Trouble

(Partner & Two Ball Exercises)

Guidelines

1. Standing Double Press
2. Standing Single Arm Press
3. Moving Press
4. Double Pump
5. Prone Push-up
6. Double Ramp
7. Double Arm Stabiliser
8. Double Dip

77	9. Double Hip Lift	97
78	10. Single Leg Hip Lift	98
79	11. Double Leg Trunk Controller	98
80	12. Single Leg Trunk Controller	99
80	13. Double Leg Squat	100
81	14. Single Leg Squat	100
81	15. Stacks	101
82	16. Maul	102
84	17. Scrum	103
85	18. Linked Sway	103
86	<i>Connect Four Exercises</i>	104
86	19. Push Press	104
88	20. Leg Press	105
89	21. Kneeling Palm Press	106
	22. Reactor	107

91 Sample Sport Specific Workouts 108

93 Flexibility Development and 93 Stretching With Your Swiss Ball 117

95 Before the Event 128

96 Weight Training With Your Swiss Ball 129

97 Bibliography 141

Strength, speed, flexibility and agility are among the fitness parameters commonly trained to make you effective in sport. The type of sport or the position in which you play will affect the relative balance of these qualities, but whether it is in a team sport or downhill skiing, you are ultimately aiming for a combination which will lead to physical control and optimal performance.

Training often focuses on obvious, easily visible muscle groups in the arms and legs. While the relationship between these muscles and the movements of the limbs is readily accepted, e.g. hamstring muscles and the knee bending movement, what is overlooked is an understanding that these muscles of the limbs depend on a solid foundation to pull from for their effectiveness. Training core stability develops this foundation.

What is Core Stability?

Core stability provides central body control, and allows you to generate power by maximising the efficiency of your muscular effort. **It is the ability of your trunk to support and withstand the forces acting upon it, including those created by your arms and legs, in order that the muscles and joints can perform in their safest, strongest and most effective positions.**

Your core is not just your back, but also the pelvic and shoulder girdles, which are responsible for transferring forces between your limbs and your trunk. The shoulder girdle is made up of your collarbones and your shoulder-blades, and provides an anchor for your arm movements via muscular attachments to your midback and rib cage. The pelvic girdle functions in a similar manner, with the abdominal and gluteal muscles working to maintain its position relative to the spine. This allows the pelvis to provide a stable base to pull and push from.

If your body isn't using the most effective combination of muscles to transfer forces between your limbs and trunk through these girdles to your spine, or if the appropriate muscles work but are relatively weak, the body will try to find a way to compensate. It does this by adjusting other parts of the body into positions that are not necessarily ideal for the demands of the movement. When this occurs, you lose efficiency, and this translates into a loss of power. It can also make you vulnerable to injuries such as shoulder tendonitis or lower back pain.

The muscles responsible for optimal force transfer between the limbs and the trunk, i.e. those that stabilise your central body, or **core**, are therefore essential for optimal body functioning. This force transfer is a necessary part of movement, and you can improve the way in which it happens to make it safe and efficient. It doesn't matter how much weight training you do on your arms and legs: **you can only be as strong as your weakest link, and if that link is your core stability, it needs to be integrated into your training.**

How can core stability improve my performance?

Correct core stability training can contribute to a number of potential benefits:

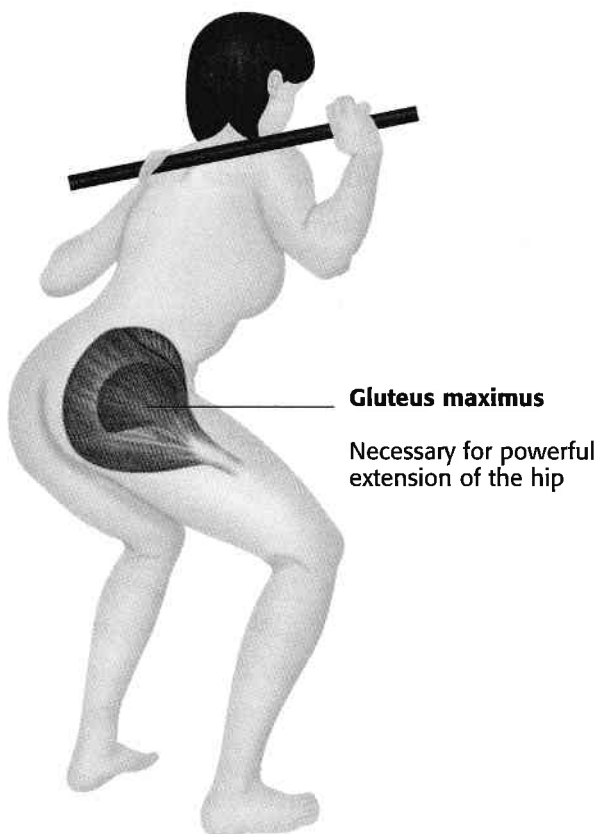
- More efficient use of muscle power, as less effort is lost in compensatory movements
- Decreased injury risk, as forces are managed by the appropriate body structures
- As body momentum is more effectively controlled
- Greater capacity for speed generation as power muscles have a secure platform to pull from
- Improved balance and muscular coordination
- Improved posture



Gluteals

The muscles around your hip and bottom are not just for sitting on – these muscles are extremely important power *generators*. The gluteus maximus (or 'glute max') is activated whenever the hip must move between bending and straightening. This means it has a key role in **speed** (think of the prominent buttocks which you see on top sprinters), **lifting** whether it is in a lineout or a dead lift, jumping forwards or upwards, **controlling** a landing, or even contributing to **balance** as a lawn bowler steps forwards!

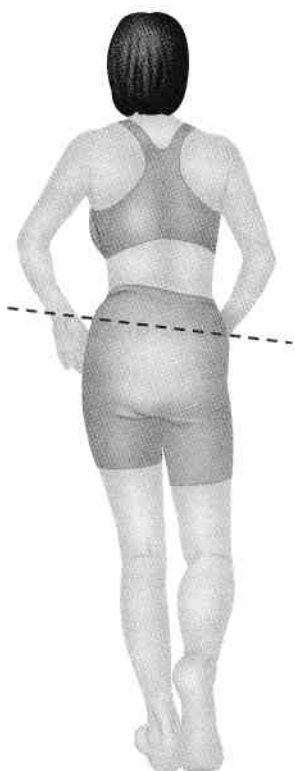
If you are involved in a propulsive sport such as basketball, football or sprinting, think of glute max as an 'engine' which drives your body forwards and upwards. If your sport requires accuracy and defined movements, the gluteal group of muscles increases control and contributes to a stable base from which to shoot, swing, kick or balance. Many of our clients, regardless of their sport, lack appropriate activation in their glutes to adequately control their hip, knee or back, and not only risk injury, but are unable to perform to their potential.



Other muscles of this region, such as gluteus medius, are responsible for side to side stability of the pelvis as well as sideways leg movement. Without this muscle functioning properly, you cannot stand on one leg without your pelvis tipping, leading to compensatory side bending of your spine and excess stress to the lower back or other parts of the pelvis, once again decreasing efficiency and risking injury.

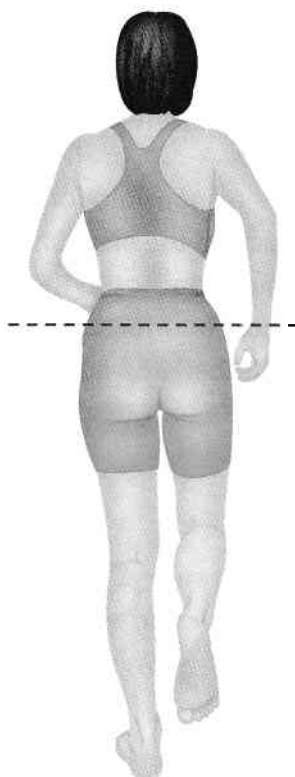
Inadequate Stability

If Gluteus medius is weak, the pelvis may tip when weight bearing on that side



Adequate Stability

With better hip abductor function, the pelvis remains level on weight bearing



HIP ABDUCTOR FUNCTION

The gluteals are also critical in the support of the lower back, and are often found to be weak, under-active or uncoordinated in individuals with lower back pain. If this is the case, you may tend to overuse your back and knees to make up for the weakness, and even everyday activities such as climbing stairs and getting out of a chair can be affected.

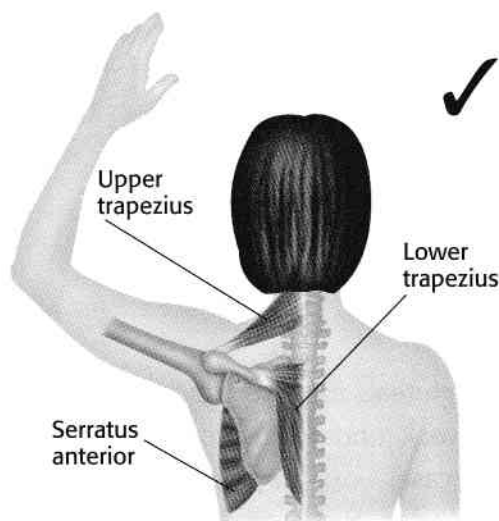
There are numerous smaller muscles in the hip region that have important roles to play in stability, and throughout *The Core Workout* they will be activated to assist the larger muscles to control your hip and knee position. The gluteals, however, need particular attention, as problems with these muscles can contribute to back, knee and groin injuries.

In the upper body, the core muscles are just as important. Just as the abdominals and gluteals contribute to and help control lower limb and back movement, another set of muscles performs the same role for the upper limb. In order for you to be able to move your arm, the muscles responsible for the movement must have a stable base to pull from. This base is your shoulder-blade, or scapula. However, to fulfil this role, the scapula must be secured to the trunk in some way, otherwise the force will be lost from your arm movement.

The muscles that are responsible for this scapular control are the upper and lower trapezius, which attach to the skull and larger bones of the lower midback, and the serratus anterior, which attaches to the ribs. These attachments give a relatively large surface area to support arm forces, and combine to angulate the scapula upwards, giving the 'ball' of the ball-and-socket joint of the shoulder room to rotate in the movement of lifting the arm.



POOR STABILISING PATTERN
FORCES SENT TO NECK AND UPPER BACK
(SMALL SURFACE AREA)



IDEAL STABILISING PATTERN
FORCES SHED ACROSS
BROAD SURFACE AREA

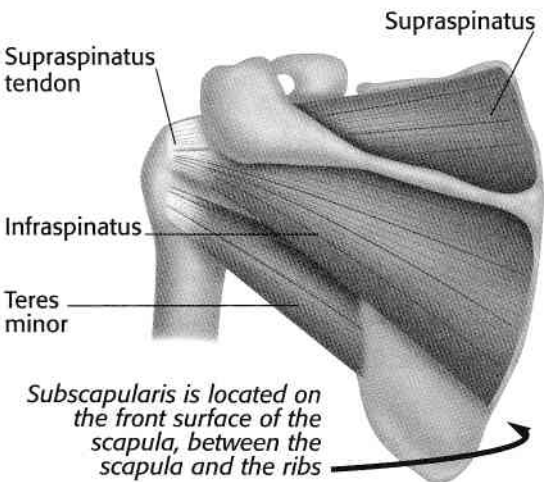
Often, however, we see athletes who do not use this pattern to achieve arm movement. Instead of staying flat on the rib cage, their scapulae lift off or 'wing', and neck and upper back muscles pull the scapula upwards. This has two effects. The

first is that arm power decreases, as the forces are sent to smaller, weaker areas such as the neck. The second is that injury risk is increased, both in the joints of the neck, as well as the tendons of the shoulder. If the scapula does not angulate upwards, there is a risk that the tendons of your shoulder will be compressed, leading to painful tendonitis.

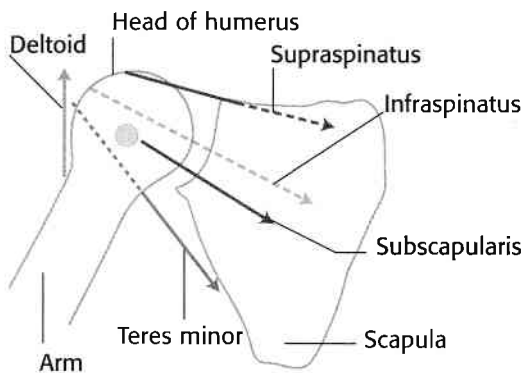
Once the scapula is well positioned to provide a good 'socket' angle, the muscles of the rotator cuff help to control the movement of the 'ball' of the shoulder joint. These muscles have a critical role to play, ensuring that the rolling and sliding motion of normal shoulder movement does not deviate forwards or upwards within the socket. Core Workout exercises involving the arms demand a great deal of stabilising muscle activity around the shoulder and if you maintain good body position, Swiss Ball training can stimulate and strengthen the rotator cuff.



It is not just the rotator cuff and scapular muscles that protect and support the shoulder. The pelvic muscles and trunk stabilisers are absolutely critical, as it is these that provide the foundation necessary for a good shoulder position. When working on your shoulders, always pay attention to controlling your pelvic and trunk position, as this will best place your shoulder in order to activate a coordinated muscle pattern.



BACK VIEW OF THE LEFT SHOULDER
ROTATOR CUFF MUSCLES



ROTATOR CUFF ACTION SECURES THE
'BALL' IN THE 'SOCKET'

Training for athletic performance has become considerably more sophisticated in recent years. For both athletes and sports professionals, the time has passed when 'doing what we've always done' is acceptable, just as using exercises and techniques without understanding how or why they are supposed to work is not good practice. Increasingly, a knowledge of how the body functions, along with a good grasp of the specific physical and psychological demands of the sport is necessary to really achieve results and avoid injury over time.

There are several principles that shape a programme for core stability:

Understand the demands of your sport

Training may focus on a selection of characteristics, but perhaps not consider the interplay between them. Ask yourself what the sport breaks down into for the individual player or athlete, e.g. linear speed, rapid change of direction, upwards or forwards explosive power, rotational control, blocking the forces of other players, ability to stop suddenly, ability to balance in a variety of body positions, ability to control ballistic actions of the upper and lower limbs, etc. If the sport requires a complex movement, such as in gymnastics or power lifting, make sure that you have a clear understanding of how such a movement is achieved.

Develop an understanding of basic anatomy and muscle actions

If you understand how your body works, it will subtly alter how you perform your movements, and help to focus your mind on what you are doing. For example, an athlete with a poor concept of muscle action and inadequate training objectives may decide to perform a bicep curl to increase bicep strength, but fails to focus on which muscles are responsible for movement, and which muscles are necessary for support. He or she simply aims to 'get the weight up', which leads to the use of momentum (swinging) combined with back motion to lift the weight. The whole body starts to move, instead of what should be a simple elbow bending movement using concentrated biceps brachii muscle effort founded on a stabilised shoulder-blade and trunk for correct support. The result of this lack of understanding is a relatively poor outcome for the effort and time spent, and a further safety risk.

Train muscles specifically for their role in your sport

If the muscle should stabilise, train it for that role whenever you train the mobilising muscles which it should support. Also remember that in sport, balance and quick muscle reactions in multiple planes are required, and that these features should be built upon a foundation of core stability.

Although the Swiss Ball has been around since the 1930s, its potential for training rather than just rehabilitation had not been explored until relatively recently. The major advantage of Swiss Ball training is that it provides an unstable support surface, which stimulates the body's stabilising mechanisms. This allows you to train the function of the muscles and not just their strength. The Swiss Ball is extremely versatile, and can be used for a variety of purposes. It allows for integrated 'whole body' exercise, from low levels through to high levels, and combines well with other forms of training.

Equipment Guidelines

Do not inflate your ball over the maximum prescribed diameter. The correct diameter is the same as the size indicated on the ball. This is the **maximum** diameter of the ball.

To Inflate

Manufacturers recommend that the ball should be half inflated overnight, and then topped up the next day so that the fabric of the ball is allowed to expand gently.

1. Mark the indicated height of the ball on a wall so that you have an idea what you are aiming for. This will be a guideline for the suggested size of the inflated ball, but not an absolute measure.
2. Remove the plug from the ball and inflate with a manual pump or air compressor. Do not over inflate, otherwise the fabric of the ball may become damaged. The ball should feel firm but not hard.
3. Measure the ball against the marked indicator on the wall. You may find that the ball is firm but is not the same size as the marked height. Some are a little smaller, and some a little larger depending upon the make

and fabric. Make your judgement based on feel. There should not be too much 'give' in the ball, and nor should it feel completely solid.

4. To deflate your Swiss Ball, remove the plug carefully by exerting a pulling pressure while moving the plug back and forth.

Basic Safety

1. Use only on a safe level ground, preferably on a non-slip surface such as a yoga mat
2. Wear shoes with non-slip soles
3. Avoid contact with sharp objects or sources of heat such as central heating radiators
4. Make sure that your practice space is clear and unobstructed
5. Do not use near stairs
6. Small parts such as the plugs may be easily swallowed, so care should be taken with small children