

# WHAT IS CORE STABILITY?

Being strong through the trunk is critical in developing good posture and preventing back soreness and injuries.

Core stability is the ability to maintain stability or position of the trunk whilst applying or receiving force to or from the limbs. This is important for a number of reasons. The major force producing muscles originate from the trunk and insert on the limbs. It is essential to have a “stable base” for these muscles to work from if the ultimate goal is to accelerate the limbs, with respect to the trunk. If excessive movement occurs at the trunk, the amount of force produced will decrease and greatly lessen the explosiveness and efficiency of the movement. To reach and maintain a stable position under dynamic conditions requires a highly skilled nervous system and accurate feedback loop to react to the fast changing conditions. This demonstrates the important relationship of strength, balance, co-ordination and proprioception to “core stability”.

## BASIS OF PROGRESSIONS

Before exercises are introduced, appropriate abdominal activation patterns are advised. This is usually in the form of a breathing activity:

- 1) Inhale
- 2) Exhale
- 3) Pull belly button towards spine by active muscular contraction (rather than a breath)

Quality of movement and balance should always be paramount. Static positions are static – require correct set up and the maintaining of good body position during any isometric contraction. There are a number of ways to increase the complexity/challenge of an exercise. These include:

- Modify base of support. The smaller the surface area in contact with the ground/fixed object, the more difficult the exercise (ie: SB bridge is harder with arms across chest, than it is with arms out-stretched at 90 degrees to the body) In the front support position, the exercise will be more difficult if attempted using 1 arm for support.
- Adjust the lever length. By moving the centre of mass further from the ball, the body’s neuromuscular system will be further challenged. Therefore, the beginner usually starts with his/her calves on the ball in the back support position. As they become more competent, they can place only their heels on the ball to make the exercise harder.
- Add movement. Not only will movement incorporate a new level of complexity to the exercises, by requiring greater muscle synchronisation, but it also enables the exercises to become more functional. The ultimate goal of any core stability program should be to make the exercises functional rather than static.

# BEGINNING YOUR SWISSBALL WORKOUT

## DETERMINING THE RIGHT BALL SIZE

Keep in mind that each individual's body proportions are different, and therefore, each exercise may need to be adapted to suit these differences. The recommended ball sizes and inflation techniques serve only as a guideline.

Ball size can be determined by athlete height and weight, intended exercise position (prone, supine, sitting, etc) and the goal of the exercise. Whilst the height may give some indication, body proportions are a more accurate indicator. The ball size must be selected on the basis of whether the patient has a long trunk and short legs or a short trunk and long legs.

A smaller ball has less surface area, requiring more energy to maintain balance. A large ball has greater surface area, and therefore, may be suitable where more stability is required.

A fully inflated or firm ball has less contact area on the floor, moves more quickly, and therefore, challenges balance reactions more than the underflated ball. An underflated ball or soft ball has greater contact area, moves more slowly, and therefore, requires less energy to maintain balance. However to achieve the correct set up position ***it is vital that when sitting on the ball, with feet flat on the floor, the hips and knees should form a 90 degree angle.***

The following serves as a guideline in determining the appropriate ball sizes for exercises in sitting:

|           |                        |
|-----------|------------------------|
| 30cm ball | children 1-2 years old |
| 45cm ball | < 5'0" tall            |
| 55cm ball | 5'0" – 5'7"            |
| 65cm ball | 5'8" – 6'3"            |
| 75cm ball | > 6'3" tall            |