



Level 1: Detailed Methodology for Each Test

Body size

Height

Equipment

Stadiometer, or a steel tape with a head board and means of maintaining a “true horizontal plane” by verifying a right angle to the vertical plane with each measurement taken.

Calibration / maintenance

Check the integrity of the stadiometer including the upright or steel tape, right angle and horizontal head board prior to each test day.

Methodology

- i) Subject must be barefooted.
- ii) Subject’s heels, buttocks, and upper back are resting against the stadiometer or wall.
- iii) Subject’s heels are together and flat on ground.
- iv) Subject is looking straight ahead and positioned so that the lower edge of the eye socket is horizontal to the highest part of the ear (Frankfort plane).
- v) Subject takes a deep breath, while one measurer applies gentle upward pressure to the jaw at the mastoid processes. Other measurer checks that the subject’s heels remain on the floor and head remains in the Frankfort plane. The head piece is then lowered firmly down in contact with the vertex (highest point of the skull).

Data collection

Measure and record the subject’s height to the nearest 0.1cm.

Units	Accuracy	Range
Centimeters	± 0.1 cm	60 – 220 cm



Body size

Sit height

Equipment

Stadiometer, or a steel tape with a head board and means of maintaining a “true horizontal plane” by verifying a right angle to the vertical plane with each measurement taken.

Calibration / maintenance

Check the integrity of the stadiometer including the upright or steel tape, right angle and horizontal head board prior to each test day.

Methodology

- i) Subject sits against the wall with the stadiometer / steel tape attached.
- ii) Subject wriggles in so that their coccyx is as close to the join of the floor and wall as possible.
- iii) Subject sits up as straight as possible with their lower body resting against the floor and upper body resting against the wall, legs outstretched with knees straight.
- iv) Subject is looking straight ahead and is positioned so that the lower edge of the eye socket is horizontal to the highest part of the ear (Frankfort plane).
- v) Subject takes a deep breath, while one measurer applies gentle upward pressure to the jaw at the mastoid processes. Other measurer checks that the subject’s buttocks remain on the floor and their head remains in the Frankfort plane. The head piece is then lowered firmly down in contact with the vertex (highest point of the skull).

Data collection

Measure and record the subject’s sit height to the nearest 0.1cm.

Units	Accuracy	Range
Centimeters	± 0.1 cm	60 – 220 cm



Body size

Body mass

Equipment

Digital scale(s) or beam balance

Calibration / maintenance

Calibrations of scales are critical at the start of each test day in order to maintain the accuracy of this critical measurement. The following basic checks should be executed.

- Zero.
- Linearity in a range from 40 to 120 kilograms. Ideally a range of known weights should be used to assess this: 40 kg, 80 kg and 120 kg, and a variance of ± 0.05 Kg accepted for each weight in order for the scales to be accepted as accurate for use.

Methodology

- Place scales on a hard, level surface.
- Subject must have light clothing and be barefooted.
- Body mass should be recorded with minimal clothing on and weight evenly distributed on both legs.

Data collection

Measure and record the subject's body mass to to nearest 0.05 kg

Units	Accuracy	Range
Kilograms	$\pm .05$ Kg	0 – 150 Kg



Flexibility

Sit and Reach

Equipment

A "sportech" sit-and-reach box or equivalent

Calibration / maintenance

Check the integrity of the sit-and-reach box or equivalent prior to each test day.

Note: Zero is set at the toes, any point reached prior to the toes is measured as a negative score, and any point reached past the toes is measured as positive score.

Methodology

- i) Rest sit-and-reach box against a wall.
- ii) Seat subject, barefooted, with soles of both feet flat against the front of the box.
Explain that the subject must:
 - Keep legs straight and back of knees flat on the floor.
 - Place one hand above the other so the fingertips of both hands remain level.
 - Reach slowly forward as far as possible without jerking and hold this position for a minimum of 3 seconds until told to relax.
- iii) As the subject performs each trial the recorder should place their hands above the subject's knees to ensure that the legs remain straight (do not hold the knees down), and count three seconds after which the measurement can be noted.
- iv) This process is repeated 3-times. Trials should be a gradual progression designed to elicit the best performance with the third trial.

Specific warm-up

Allow the athlete one practice – not at full stretch. In order to maintain the accuracy and reliability of the results of this test it is essential that it be performed "cold" without any preliminary warm-up.

Data collection

Measure and record the distance reached on the best trial to the nearest 0.5cm.

Units	Accuracy	Range
Centimeters	± 0.5cm	-15 to +40 cm

Special notes

Some sit-and-reach boxes start with zero at -15cm and so the measurements need to be adjusted accordingly to meet the calibration criteria noted above.



Core function

Seven stage sit-up

Equipment

Clear floor area and mat
2.5 kg weight disc, 5 kg weight disc
Set square

Calibration / maintenance

None

Methodology

- i) Start and finish position: The subject lies supine on the floor or mat, with their feet and back flat on the floor and knees raised so that their tibia and femur are at 90 degrees (use a set square to establish that the tibia and femur angle is 90 degrees).
- ii) For all levels the subject is asked to tilt their pelvis back to flatten the lower back onto the floor. They are then asked to tilt their head forwards so that their chin is tucked in towards their chest. They then smoothly flex the trunk in a controlled manner until the requirements of the level being executed are completed. After the execution of each level the subject returns to the starting position.
- iii) The subject always completes each level in sequence until they fail.
- iv) The last successful level is recorded as that achieved by the subject.
- v) An attempt is considered unsuccessful if the subject displays poor technique during a sit-up by:
 - a) Lifting either heel off the floor
 - b) Jerking forward quickly in order to create momentum to lift the body off the floor
 - c) Throwing the arms or head forward, moving arms from the nominated position
 - d) Lifting hips from the floor
 - e) Failing to maintain a 90 degree knee angle
 - f) Being unable to complete the sit-up

Levels 1-7 of core function test:

- Level 1 Subject to place both arms relaxed by their sides, and perform a pelvic tilt with their back flattened on the floor.
- Level 2 Subject to perform a sit-up with both arms relaxed by their sides, bringing fingers to touch the heels, while the feet are held by the assessor.
- Level 3 As above but with the feet not held: *Feet must maintain full contact with the floor throughout the movement.*
- Level 4 Arms flexed across abdomen, hands gripping opposite elbows, flex the trunk to perform a sit-up until the back of the forearms touch the thighs: *Feet must maintain full contact with the floor and forearms must maintain contact with the abdomen throughout the movement.*
- Level 5 Arms flexed behind the head, hands gripping opposite shoulders, flex the trunk to perform a sit-up until the chest touches the thighs. *Feet must maintain full contact with the floor throughout the movement.*
- Level 6 Arms flexed behind the head with hands gripping opposite sides of a 2.5 kg weight disc behind the shoulders, flex the trunk to perform a sit-up until the chest touches the thighs. *Feet must maintain full contact with the floor throughout the movement.*



Level 7 Arms flexed behind the head with hands gripping opposite sides of a 5 kg weight disc behind the shoulders, flex the trunk to perform a sit-up until the chest touches the thighs. *Feet must maintain full contact with the floor throughout the movement.*

Data collection

Record the last successful level that is achieved by the subject.

Units	Accuracy
Arbitrary Level	n/a



Strength and Power

Vertical Jump

Equipment

A Vertec™ or a Yardstick™ (which is a specialized piece of equipment designed solely for the measurement of vertical jump) is most desirable. If not available a black plywood board, 2m long and 30cm wide, marked off in 1cm increments can be used. It should be mounted at least 15cm out from the wall and a chalk bag will need to be provided.

Calibration / maintenance

Check the integrity of the Vertec™ or Yardstick™ prior to and at the end of each test day making sure that no slats are damaged or bent and that any such damage is tended to well in advance of any subsequent testing.

Safety precautions

Subjects with recent or chronic back pain, recent injury, or surgery to the shoulders, hips, knees or ankles must be excluded from test. Any chronic problems should be checked by a doctor or physiotherapist and the athlete asked to provide a written clearance before testing is permitted.

Methodology

If using a Vertec™ or Yardstick™:

The athlete stands directly underneath the measuring slats with heels on the ground and dominant arm, shoulder, and fingers fully extended touching the highest slat. The measurer should square the shoulders of the subject and stretch the extended arm to its full length. This is the athlete's standing reach. The Vertec™ is then raised to set this point as zero and the moveable slats to within the athletes jumping height range. The athlete then jumps using a counter-movement (down-up motion) without taking a step, touching the highest slat possible. The height jumped is then measured and recorded.

If using a board and chalk:

The athlete first dips their hand in chalk then stands directly underneath the board with their heels on the ground and dominant arm, shoulder, and fingers fully extended touching the board with their chalky fingers. The measurer should square the shoulders of the subject and stretch the extended arm to its full length. This is the athlete's standing reach. The athlete then jumps using a counter-movement (down-up motion) without taking a step, touching as high on the board as possible. The standing height is then subtracted from this height to determine the height the athlete has jumped. This measurement is then recorded.

Three trials will be performed and the best of these measurements recorded to the nearest 0.5cm.

Specific warm-up

Athlete should perform 2-3 trials at increasing intensity prior to performing the 3 max efforts.

Data collection

Measure and record the height jumped in cm's.

Units	Accuracy
Centimeters	± 0.5cm



Aerobic fitness

20m shuttle-run

Equipment

- Flat non-slip surface, recommended minimum 30m long, width is determined by how many athletes are running at the same time. Use the same surface from test to test if possible.
- Shuttle-run CD.
- CD player.
- Marker or tape to clearly mark the turning points.
- Tape measure 20m or longer to determine the turning points.

Calibration / maintenance

Follow the calibration instructions prior to every test and modify the running distance according to the table provided.

Methodology

Follow the audio directions for the correct protocol.

Specific warm-up

Athlete should perform 5-10 shuttles of the first level in order to gain familiarity with procedure and timing of the CD.

Data collection

Record the shuttle and level achieved.

From the conversion sheet provided with the CD convert this into a prediction of (VO_2), in ml/kg/min.

Units	Accuracy	Range
Stage OR ml/kg/min	Not applicable	26.8-86.8 ml/kg/min

Special notes

Any athletes who have been identified as asthmatic should follow a consistent protocol of management in relation to medication prior to testing. In cases of pre-existing medical conditions, it is recommended that the athlete consult with their physician and develop a consistent protocol of management that should be followed consistently prior to both training and testing.



Anaerobic fitness

60 second box jump

Equipment

- Flat non-slip surface, preferably same surface and conditions from test to test.
- Box: 40cm high – 50cm long – 40cm wide.
- Stopwatch.
- Scoring sheet.
- A minimum of 2 spotters.

Calibration / maintenance

Check the integrity of the sit-and-reach box or equivalent prior to each test day.

Methodology

The test is performed as 60 seconds of maximum jumping.

To start, the athlete stands next to the box (on the long side of the box) waiting for a count down from 5 to 1. The two spotters sit on the floor with feet against the box to ensure stability of the box during the test. The athlete jumps from the ground up on the box, the timing starts when the athlete lands on the box. The athlete jumps laterally back and forth over the box facing the same way for the entire duration of the test. The athlete lands on top of the box each time he/she moves laterally from side to side. Each time the athlete lands on top of the box one jump is recorded.

Specific warm-up:

Athlete should perform 2-3 trials at increasing intensity prior to performing this test doing 3-4 jumps each time.

Data collection

The number of jumps are counted and recorded for every twenty seconds including the last top touch on the box of each jump period.

Units	Accuracy	Range
No. of jumps	± 1 jump	Not applicable