



PLAYER PROFILE - PHYSICAL FITNESS TESTING GUIDELINES Zone/Centre & School Programmes (U/15 to U/21's)

Why Test?

The standardised physical testing of athletes is a critical factor in Netball NZ's ability to develop athletes into World Class Silver Ferns. The Netball NZ Player Profile identifies the physical area as a key to an athlete's development and this encompasses both general and position specific fitness.

Physical testing allows for;

- The tracking and monitoring of players across all programme levels in line with the physical element of the Netball NZ Player Profiles and underpinning benchmarks
- Transparency for athletes on the physical expectations required to successfully progress to each level of the high performance pathway
- The identification and assessment of physical strengths and weaknesses in athletes so that appropriate training can be implemented.
- The assessment of an athlete prior to and following a period of training to measure improvement and to assess the effectiveness of an implemented strength and conditioning programme.
- Assessment of whether a player has returned to adequate / previous fitness levels following an injury or a period away from training/ playing.

Testing Considerations

When and How often to test?

Physical testing should be conducted several times throughout a season or programme. It is recommended that a baseline/ initial testing of athletes occur at entry or beginning of a training period. Subsequent testing should be conducted in line with the programme activities and ideally every 4-6 weeks.

It is also recommended that to help familiarise and normalise the tests with athletes that personnel look to integrate them into training sessions so they are not used as one off's or purely on testing days.

Test preparations

To ensure the testing that is conducted is valid and reliable NNZ recommends the following guidelines;

- Testing should occur on the surface on which the sport is played in this instance a wooden indoor court surface.
- If possible, record what surface, time of day and temperature that the test was performed at, plus the tester's name.
- Conduct all testing if possible in an indoor netball court or gymnasium environment, to eliminate all weather conditions
- Ideally it is best to test speed, power and Yo-Yo on one day, in that order and if you have strength testing to perform this on a separate day.
- If it is necessary to complete all testing on the same day the preferred order is:
 1. Anthropometric
 2. Power/ Elevation and Speed & Change of Direction can be conducted together
 3. Yo-Yo
 4. Strength

What are the tests?

The physical tests outlined below have been identified as part of the Player Profile for U/15yrs to U/21 's level. The Beko League level will still incorporate these tests however, at this level and in National Programmes i.e. Silver Ferns Development Squad and above, a more detailed and comprehensive testing battery is undertaken.

1. Anthropometric	2. Power/Elevation	3. Speed & Change of Direction	4. Aerobic Fitness
Height	Broad Jump	5, 10, 40m Speed (in a 20m shuttle)	Yo-Yo
Body Mass Arm Span Hand span	Vertical Jump	5 0 5 Agility	

Where is Strength testing?

Please note that this information does not contain any Strength testing benchmarks or protocols. The rationale for not including any obvious tests as part of this resource is that for the ages and groups that this resource is targeted towards the focus should be on the **development of competent and efficient movement**. This is to ensure individuals have the base for on-going athletic development. Netball NZ will undertake strength tests and the development of this area with those athletes identified in as part of national programmes. A Zone or Franchise may also have further tests or benchmarking which they will utilise with their Beko League and Franchise teams.

The building of sound and correct movement skills can be found on **Netball NZ's Netball Smart** website area. Please note that resources continue to be developed over time so please continue to check the website for the most up-to date information.

Why these tests?

Netball NZ in conjunction with AUT has conducted research in order to ascertain the validity of these tests in relation to the netball and the physical requirements of each position. The research has indicated that the above tests are valid and are reflective of the physical and positional demands of competing.

FITNESS TESTING PROTOCOLS

ANTHROPOMETRIC PROTOCOLS

1. Standing Height

Standing height is the measurement of the maximum distance from the floor to the highest point on the head, when the subject is facing directly ahead.

Equipment required

Stadiometer, steel ruler or tape measure placed against a wall.

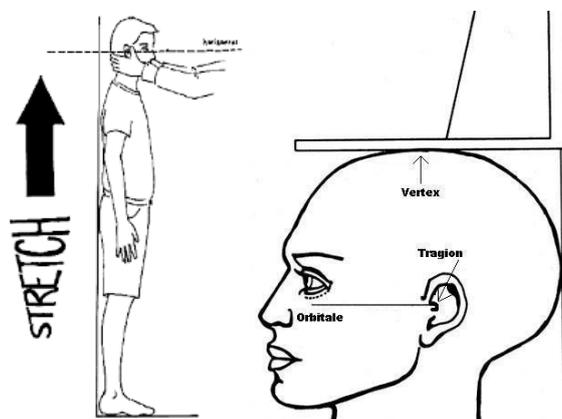
Protocol outline

Shoes should be off, feet together, and arms by the sides.

Heels, buttocks and upper back should also be in contact with the wall when the measurement is made. The head should be placed in the Frankfort plane (See diagram below).

Reliability

Height measurement can vary throughout the day, usually being higher in the morning so to ensure reliability height should be measured at the same time of day.



The Frankfort plane is achieved when the orbitale (lower edge of the eye socket) is in the same horizontal plane as the tragion (the notch superior to the tragus of the ear). When aligned the vertex is the highest point on the skull.

2. Body Mass

Measuring body mass can be valuable for monitoring body fat or muscle mass changes, or for monitoring hydration level.

Equipment required

Scales, which should be calibrated for accuracy using weights authenticated by a government department of weights and measures.

Protocol outline

The individual stands with minimal movement with hands by their side. Shoes and excess clothing should be removed. If an individual does not want to see their body mass score they can stand facing backwards on the scale and the tester can then record the mass.

Reliability

To improve reliability body mass should ideally be taken in the morning. Body mass can be affected by fluid in the bladder and other factors to consider are the amount of food recently eaten, hydration level, recent exercise, menstrual cycle fluctuations and clothing. If you are monitoring changes in body mass, try and weigh at the same time of day, under the same conditions. Always compare using the same set of scales.

3. Arm Span

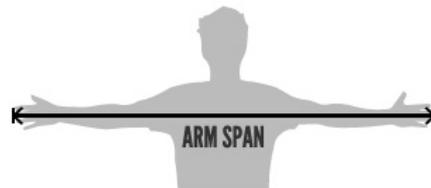
Longer arm spans may be advantageous in Netball as reaching and blocking skills are involved.

Equipment required

Ruler or tape measure, wall.

Protocol Outline

Facing away from the wall, with back and buttocks and heels touching the wall. Arms are stretched out horizontally. Measure from one furthestmost fingertip to the other.



4. Hand Span

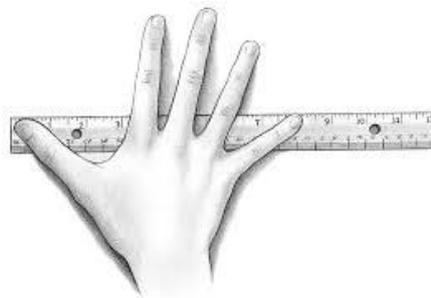
The size of the hand is advantageous for some sports which involve catching, gripping or tackling.

Equipment required

Flat surface and ruler or tape measure

Protocol Outline

The hand is placed palm down on a flat surface. The fingers are outstretched as far as possible. Measure the linear distance between the outside of the thumb to the outside of the little finger.



POWER/ELEVATION

5. Broad Jump

To assess the players lower body power and their ability to jump horizontally for maximum distance.

Protocol Outline

- The athlete stands with their toes on a line marked on the court (photo 1). They then swing their arms back while bending their knees and hips (photo 2) and jump as far as possible forward landing on both feet (photo 3).
- The athlete stays in the finish position until the measurement has been taken.
- Measure the distance from the start line to the athlete's heels where they landed. This is the distance jumped.
- Perform three attempts recording the best distance jumped.

Equipment required

Tape measure, recording sheet

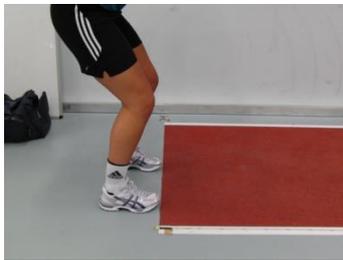


Photo 1 – the athlete starts with their toes behind the line.

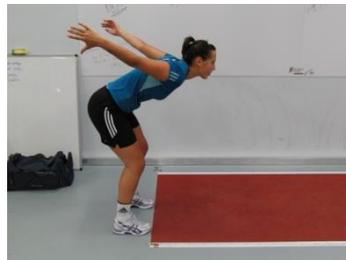


Photo 2 – the athlete swings the arms and bends the knees and hips to jump.



Photo 3 – the athlete lands on both feet in a controlled manner. Arms can be out in front or at sides.

6. Vertical Jump

To assess the player's lower body power and their maximum vertical jump ability using both legs.

Protocol Outline:

Option A – Using a Jump Vertec (recommended)

Bilateral / Double leg Counter Movement Jump

- First measure the athlete's reaches height. The athlete stands underneath the Vertec with both feet flat on the floor. They then reach up, with their inside hand, as high as possible and move the furthestmost finger of the Vertec away (see photo 4). Note the shoulders do not have to remain square i.e. get them to reach as high as possible lifting the shoulder of the reaching arm. The number on the final finger moved is recorded as the standing reach height. (see photo 5).
- The athlete then performs a maximal countermovement jump by bending the ankles, knees and hips and then immediately jumps as high as possible attempting to move as many fingers of the Vertec as possible i.e. reach for the highest finger possible (see photo 6).
- The final finger moved is recorded as the maximal jump height.
- Subtract the standing reach height from the maximum jump height to get the actual jump height.
- The athlete performs one test and is allowed to jump until they cannot get any higher. Ideally they are allowed 30-40 seconds between jump attempts.
- Record absolute jump height, athlete reach and reach adjusted jump height.



Photo 4 – the athlete reaches as high as possible using the inside hand.



Photo 5 – the number on the vertec finger at the top of the athlete's reach is the standing reach height.



Photo 6– the player jumps as high as possible attempting to move as many fingers away as possible.



Photo 7 – the number on the last finger moved by the athlete is the jump height.

Option B – Using Chalk or a Pen against the wall

Bilateral / Double leg Counter Movement Wall Jump

- The athlete stands side on to a wall with their feet flat on the ground and reaches up as high as possible, with the hand closest to the wall, while holding a piece of chalk/pen. They make a mark on the wall at maximal standing reach height.
- The athlete then stands away from the wall slightly and performs a maximal countermovement jump by bending the ankles, knees and hips and then immediately jumps as high as possible using both arms and legs to assist in projecting the body upwards. The athlete marks the wall with the chalk/pen at the highest point of the jump.
- Subtract the standing reach height from the maximum jump height to get the actual jump height.
- The athlete performs one test and is allowed to jump until they cannot get any higher. Ideally they are allowed 30-40 seconds between jump attempts.

Equipment required:

Vertec, recording sheets, chalk, tape measure.

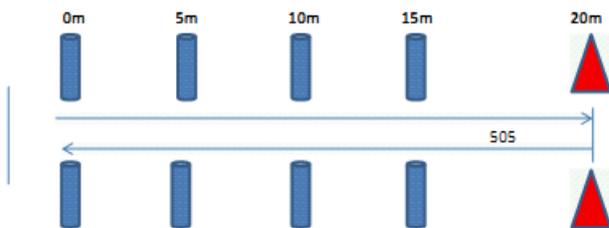
SPEED AND CHANGE OF DIRECTION

5, 10 and 40m Speed/ 505 Agility

To assess the player's straight line acceleration, speed and maximal 5-0-5 agility. Looking for absolute speed over the 5m, 10m and 20m out and back (40m) markers, not just within the 505 at the far end.

Protocol:

- Where possible use dual beam lights (swift lights preferable). Gate height is set at one extension of the tripod legs only.
- Athletes perform a 20m single turn out and back sprint with lights placed at 5m, 10m and 15m with a 20m 180 degree turn and return to start.
- Place the lights at the start line, 5m, 10m, and 15m lines ensuring that there is at least 15-20m run out at each end of the lights and place a cone marker and tape on the 20m turning line.
- Place a piece of tape on the floor 50cm from the start light. The athlete must start with their toe immediately behind this line (see photo 8).
- The athlete must start the test from a stationary position with no rocking or swaying (photo 9).
- The athlete begins their sprint once the tester indicates that the timing equipment has been zeroed and ready to record their score.
- The athlete performs a 20m sprint 180 degree turn and returns through starting gates as fast as possible.
- If the athlete does not touch the 20m line during their turn the sprint must be repeated as it is not counted.
- Athletes should perform a compulsory turn off the left foot, then the right foot and two freestyle attempts. If there is a turning deficit of greater than 5-% this needs to be noted within the results.
- Approximately 2-3 minutes rest in between attempts.



Equipment required

Electronic timing lights, tape measure, tape, recording sheet, flat, non-slip indoor surface.



Photo 8 – the athlete starts the sprint with their toe on tape 50cm from start line.



Photo 9 - the athlete must start from a stationary position with no rocking/swaying.

Note it is not recommended to attempt the 5, 10m speed tests without electronic timing equipment as using a hand held stopwatch is too inaccurate for such short distance tests

Option B 40m Only – Using A stopwatch

Though the accuracy of a stopwatch is not as high as timing gates, over the 40m distance results are comparable and it is recognised that it is not feasible to expect clubs/centres and schools to have access to timing gates.

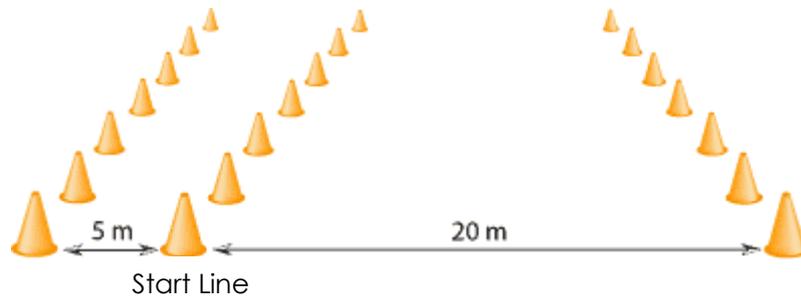
40m Speed

Set up as above though only mark out the start and a straight 40m line (no 20m split)
The timer stands at the Finish line and counts the individual down to start the test.
Athletes are allowed 2-3 attempts with 2-3 minutes rests between each attempt.

AEROBIC FITNESS

Yo-Yo Intermittent Recovery Test Level One

To assess the player's aerobic fitness and ability to sustain continuous efforts over an extended period of time.



Protocols

Please ensure that athletes have completed a warm-up (approx. 10mins)

The athlete starts with their foot just behind the start line. They begin running 20 m when instructed by the cd/mp3. The athlete turns and returns to the starting point when signaled by the recorded beep. There is an active recovery period interjected between every 20 meter shuttle (out and back), during which the athlete must walk or jog to the other cone (5m) and return to the starting point. A warning is given when the subject does not complete a successful out and back shuttle in the allocated time, the athlete is then removed the next time they do not complete a successful shuttle.

Athletes are expected to adhere to the following criteria:

- An athlete is considered to have missed a shuttle if some part of the athlete's torso or foot has not passed over either the start or 20m line when the beep occurs.
- If an athlete doesn't make the start/finish line before or on the sound of the beep, athletes are given one warning for the first missed effort and on their second missed shuttle the test is then terminated/completed.
- A warning will also be issued if an athlete does not meet the 20m line. Similar to the start/finish line on the second missing of the 20m line an athletes test is then terminated/completed.
- Athletes must travel out to and reach the 5m recovery cone in each turn around between shuttles.
- A break is considered to have occurred if an athlete's back foot leaves the ground prior to the beep sounding. An athlete may break once. On the second break they get a warning and then for every subsequent break from then, a shuttle is deducted from their final Yo-Yo score.
- An athletes final Yo-Yo score is the last successful shuttle **minus** any deductions incurred as described above.

Equipment required

Yo-Yo test CD (NZ \$77.50) which can be purchased from:

<https://www.hartsport.co.nz/Fitness/Fitness-Testing-and-Measurement/Physical-Tests/Yo-Yo-Beep-Tests-8-088>

or Bluetooth device with mp3 file which can be used to stream the test:

iOS Apps>Educational Software>Health & Fitness Software>Yo-Yo Test (US \$3.99)

CD player/stereo, tape measure, tape or cones, recording sheets,

flat non-slip surface (ideally indoor court).

Two Types of Yo-Yo Test

There are two types of test: **the Yo-Yo Intermittent Recovery Test** and the **Yo-Yo Intermittent Endurance test**. The former of these two has a 10 second break after each 2 x 20m sprint, and the latter only gives you 5 seconds making it a bit closer to the classic beep test.

The one to use with Netball athletes is the Yo-Yo Intermittent Recovery Test as it better mirrors the demands of the game with short breaks followed by runs at higher intensity.

There are **two grades** of the Yo-Yo Intermittent Recovery Test: **Level 1 ("IR1") and Level 2 ("IR2")**. The set up for both is the same with the difference being that level 2 starts at a speed of 13km/h whereas level 1 starts at 10km/h. They both progress upwards in speed as the test progresses. Level 1 is designed for lesser trained individuals and level 2 aimed at well trained and elite athletes. Both test variations have increasing speeds throughout the test.



NETBALL
NEW ZEALAND

**PHYSICAL TESTING BENCHMARKS
DEVELOPMENT PROGRAMME LEVEL
NZTD/NZSS**

PROTOCOL	BENCHMARK	SILVER FERNS STANDARD
POWER/ELEVATION		
Broad Jump (cm)	210cm	>250cm
Vertical Jump (cm)	45cm	>65cm
STRENGTH		
MCS- BODY WEIGHT ROUTINE		
SPEED		
5-0-5	<2.45s	<2.29s
5m	<1.1s	<1.00s
10m	<1.8s	<1.70s
40m	7.75s	<6.95s
AEROBIC		
Yo-Yo	GS 15.5	18.1+
	GA 16+	18.6+
	WA 16.5+	19.2+
	C 16.5+	20.1+
	WD 16.5+	18.6+
	GD 16.5+	18.6+
	GK 15.5+	17.6+