

1. Measuring and Scoring

Leg length. Athlete lies on their back, lifts the hips off the floor and lowers them again, to square and level the pelvis on the floor. Measure in centimetres with a cloth tape from the front bony point of the hip (ASIS) to the lowest point of the inside ankle bone.⁴ Measuring to the outside ankle bone makes only a trivial difference.⁶

Reaches. Barefoot, hands free. Practice first (the original protocol used six practice reaches per direction), then record three reaches in each direction and keep the best.⁴

%LL = reach (cm) ÷ leg length (cm) × 100

Composite (%) = (anterior + posteromedial + posterolateral) ÷ (3 × leg length) × 100

Asymmetry (cm) = difference between right and left reach, for each direction

All norms below are %LL on the lower quarter Y-Balance kit unless marked otherwise. Compare an athlete with the group most like them, tested the same way.

2. Average Scores for Men and Women (%LL)

	Anterior	Posteromedial	Posterolateral
Men	71.9	109.6	107.0
Women	70.8	102.3	102.0

Pooled averages from a meta-analysis of published studies.¹ Men reached farther in the two back directions. Anterior reach did not differ.

3. Composite Norms by Sport

Sport, pooled across studies	Composite	University athletes	Women	Men
Soccer	97.6	All sports	100 ± 6 (87)	102 ± 8 (103)
Baseball	97.4	American football		102 ± 7 (69)
Basketball	92.8	Cross country	99 ± 5 (17)	101 ± 12 (13)
		Soccer	102 ± 6 (28)	
		Swimming and diving	102 ± 7 (17)	

Meta-analysis: each figure combines every study in that sport into one average.¹

Mean ± SD (number of athletes), US Division I. Groups under 10 athletes left out.²

4. Male Soccer Players by Level (%LL)

Level (average age)	n	Anterior	Posteromedial	Posterolateral	Composite
High school (15.6)	38	76.2	111.0	108.2	98.4
University (18.8)	37	72.8	115.2	114.6	100.9
Professional (26.2)	44	72.2	118.5	114.7	101.8

Left and right legs averaged. Higher levels reached farther in the back directions; the composite difference between levels was not significant.³

5. Asian Athletes: Korean Elite High School Basketball

Position	n	Composite left	Composite right
Guard	97	91.5 ± 9.0	91.8 ± 8.9
Forward	69	88.7 ± 5.8	89.1 ± 5.9
Centre	38	85.3 ± 7.8	86.2 ± 7.5
All players	204	89.4 ± 8.1	89.8 ± 8.0

Mean ± SD, barefoot, best of two reaches (fewer than the standard three).⁵ No published Thai reference values were found; your own squad baseline is the most useful norm.

6. Asymmetry Norms (difference between legs, cm)

Korean elite high school basketball	n	Anterior	Posteromedial	Posterolateral
Guard	97	4.15 ± 2.82	5.02 ± 4.24	5.64 ± 4.82
Forward	69	3.91 ± 3.98	4.14 ± 3.44	6.23 ± 4.80
Centre	38	3.58 ± 2.49	6.63 ± 5.20	7.21 ± 5.26
All players	204	3.97 ± 3.20	5.02 ± 4.26	6.13 ± 4.91

Mean ± SD of the right to left difference in healthy players.⁵ The composite is worked out for each leg on its own, so it does not show asymmetry.

7. Cut-off Scores and Real Change

- **Composite below 94%:** 6.5 times the injury rate in high school girls' basketball, on the floor version of the test.⁷
- **Composite below 89.6%:** 3.5 times the injury rate in 59 university American football players.⁸
- **Anterior difference over 4cm:** 2.5 times the injury rate in high school basketball, floor version.⁷
- **Posteromedial difference of 4cm or more:** 3.86 times the odds of injury in male soccer players.¹
- **Mixed evidence:** only 1 of 13 studies linked the composite with injury, and asymmetry was linked in 3 of 12 anterior and 3 of 10 back direction studies.¹ Use cut-offs as a reason to retest and watch the athlete more closely, not as a pass or fail line or a diagnosis.
- **Real change:** with the same tester, about 6 points anterior or about 8 points in either back direction before a change is more than measurement noise.⁹

8. Recording Log

Athlete: _____	Sport: _____	Date: _____	Tester: _____
Leg length left (cm): _____		Leg length right (cm): _____	

Test 1

	Left leg stance (cm)					Right leg stance (cm)					
Direction	1	2	3	Best	%LL	1	2	3	Best	%LL	Diff
Anterior											
Posteromedial											
Posterolateral											
Composite											

Retest Date: _____ Tester: _____

	Left leg stance (cm)					Right leg stance (cm)					
Direction	1	2	3	Best	%LL	1	2	3	Best	%LL	Diff
Anterior											
Posteromedial											
Posterolateral											
Composite											

Left leg stance means standing on the left foot and reaching with the right. Diff is the difference between the best left and best right reach, in cm.

Sources

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