

BIOMECHANICAL ASSESSMENT REPORT

Emma Clarke

Single-leg squat

DATE

14 April 2026

AGE

35 years

SPORT

Running and football

PROFESSIONAL

Sarah Lee

We assessed how you control your hip, knee and trunk when squatting on one leg.

Your summary

For each exercise, the traffic light sums up what we saw. Below we explain, in plain words, what is going well, what we can improve and where to focus your training.

● Good ● Keep an eye on ● To work on ● No reference

Single-leg squat

● To work on

We found some important points to work on; with the right training plan, they can be improved.

● WHAT IS GOING WELL

- Knee steadiness: within the expected range.

● WHAT WE CAN IMPROVE

- On the left, the thigh moves inward more than expected.
- On the left, overall stability in the single-leg squat is lower than expected.
- On the left, the knee moves inward more than expected.
- When standing on the left, the pelvis drops on the opposite side more than expected.
- When standing on the left, the trunk leans sideways more than expected.

● SUGGESTED TRAINING FOCUS

- Strengthening of the hip abductors and external rotators, and pelvic control in single-leg stance.
- Neuromuscular control programme for the hip, knee and trunk in single-leg stance, with progressive difficulty.
- Strengthening of the hip abductors and external rotators, and knee control training (knee in line with the foot).
- Strengthening of the gluteus medius and hip abductors, including single-leg exercises.

Notes from your professional

Sample report with fictitious data.

This video assessment is a movement screen, not a diagnosis. Results should be interpreted by your health professional together with the clinical assessment.

TASK 1 OF 1

Single-leg squat

To work on

Single-leg squat in front view, 3 repetitions per leg. It assesses dynamic knee valgus (FPPA), pelvic drop, hip adduction, lateral trunk lean and depth.

CAPTURE QUALITY

Valid repetitions: R 3 · L 3 · Tracking 100 % · 30 fps

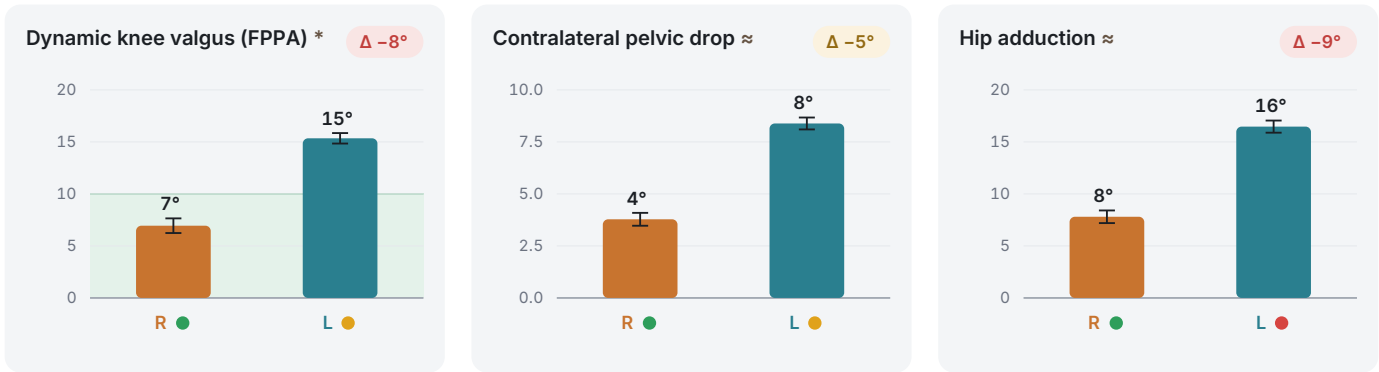
Results

Metric	Right	Left	Asymmetry LSI · R – L	Reference
Dynamic knee valgus (FPPA) *	7° ± 0.7	15° ± 0.5	–8°	0–10° Herrington 2014; Munro 2012; Read 2018
Contralateral pelvic drop ≈	4° ± 0.3	8° ± 0.3	–5°	No 2D norm: compare sides and progress Crossley 2011; Dingenen 2014
Hip adduction ≈	8° ± 0.6	16° ± 0.6	–9°	No 2D norm: compare sides and progress Crossley 2011; Scholtes & Salsich 2017
Lateral trunk lean ≈	3° ± 0.4	6° ± 0.3	–3°	No 2D norm: compare sides and progress Crossley 2011; Dingenen 2015
Knee medio-lateral sway ≈	0.7 % ± 0.1	1.0 % ± 0.2	–0.3 % LL	No 2D norm: compare sides and progress
Squat depth ≈	22 % ± 0.2	21 % ± 0.2	LSI 96 %	No 2D norm: compare sides and progress Crossley 2011
FPPA variability across repetitions ≈	0.7°	0.5°	—	0.0–3.0° Munro 2012 (SEM 2,7–3,0°)
Stability index (SLS) *	94	43	LSI 46 %	70–100 KINESTA (índice de triagem)

● within reference ● borderline ● outside reference ● no norm (compare sides)
* threshold proposed from published mean ± SD (to be validated)
≈ no reliable 2D norm: compare sides and track over time
Asymmetry: LSI = smaller side ÷ larger side × 100 %; or difference R – L (right – left).
Values: mean ± SD of valid repetitions/cycles.

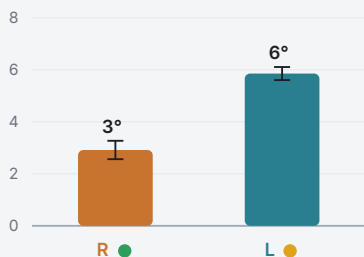
Right vs left

Right Left Reference range



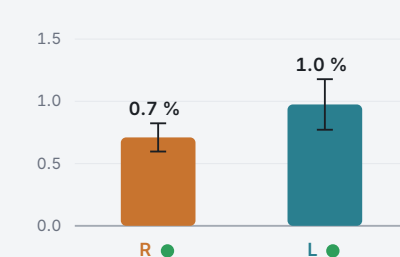
Lateral trunk lean ≈

Δ -3°



Knee medio-lateral sway ≈

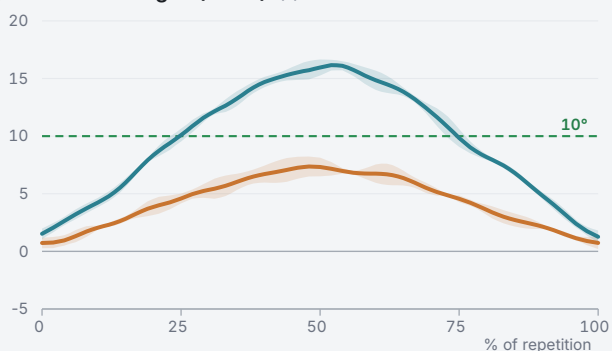
Δ -0.3 % LL



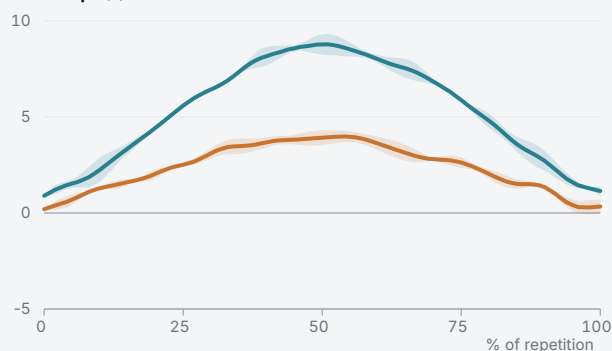
Throughout the movement

— Right — Left — mean ± SD - - - reference limit

Dynamic knee valgus (FPPA) (°)



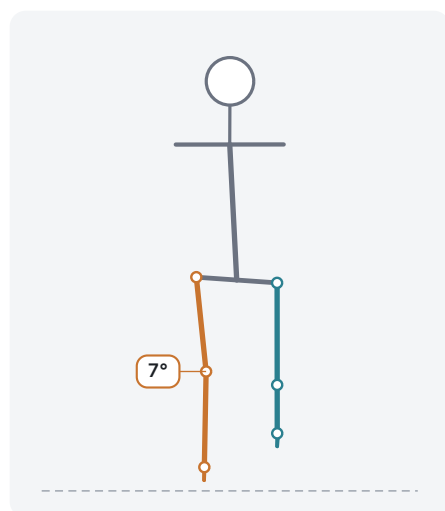
Pelvic drop (°)



Key positions

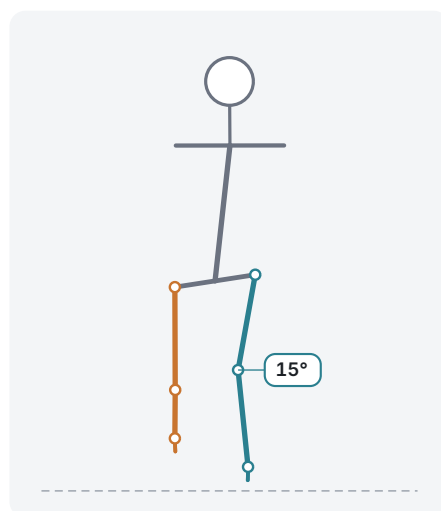
Front view: the client's right side appears on the left of the image.

Bottom of the squat Right leg



● Dynamic knee valgus (FPPA) · R: 7°

Bottom of the squat Left leg



● Dynamic knee valgus (FPPA) · L: 15°

Methods and references

How the assessment was done

The assessment used 2D video recorded on an iPhone. A pose-estimation model automatically detects the joints in every frame; angles, distances and times are the mean of the valid repetitions or cycles on each side. Curves show the mean $\pm$ standard deviation normalised to 0–100 % of the repetition or cycle (or in milliseconds after contact).

Limitations

Angles measured in 2D are projections onto the camera plane and depend on camera alignment and distance, clothing and lighting. Compared with reference 3D analysis, the typical error of 2D pose estimation is 4–7° (Stenum 2021). Differences between assessments smaller than the measurement error should be interpreted with caution.

How to read the results

Traffic light: green = within reference; amber = borderline, keep an eye on it; red = outside reference, to work on; grey = no reliable 2D norm — compare both sides and track over time. Asymmetry is given by the limb symmetry index (LSI = smaller side $\div$ larger side $\times$ 100 %) or by the right – left difference.

References: unmarked values are published norms; * = threshold proposed from published means $\pm$ standard deviation or measurement error (to be clinically validated); $\approx$ = no reliable 2D norm. References depend on sex and profile (athlete or general population).

This assessment is a movement screening, not a diagnosis. Results should be interpreted by the health professional together with the clinical history and physical examination.

References cited

1. Crossley 2011. Am J Sports Med. doi:10.1177/0363546510395456
2. Dingenen 2014. Phys Ther Sport. doi:10.1016/j.ptsp.2013.05.001
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4. Herrington 2014. Knee. doi:10.1016/j.knee.2013.11.011
5. Munro 2012. J Sport Rehabil. doi:10.1123/jsr.21.1.7
6. Read 2018. J Athl Train. doi:10.4085/1062-6050-493-16
7. Scholtes & Salsich 2017
8. Stenum 2021. PLoS Comput Biol. doi:10.1371/journal.pcbi.1008935