

BIOMECHANICAL ASSESSMENT REPORT

Emma Clarke

Lateral step-down

DATE	AGE	SPORT	PROFESSIONAL
6 October 2026	35 years	Running and football	Sarah Lee

We assessed how you control your hip, knee and pelvis when slowly stepping down from a step 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

Lateral step-down

● Keep an eye on

Your movement is generally good, with a few points to improve that can be addressed with training.

● WHAT IS GOING WELL

- Pelvic stability: within the expected range.
- Trunk posture: within the expected range.
- Knee steadiness: within the expected range.

● WHAT WE CAN IMPROVE

- On the left, the knee moves inward when lowering from the box more than expected.
- On the left, the thigh moves inward more than expected when lowering.
- Overall stability: notable difference between sides, less favourable on the left leg.

● SUGGESTED TRAINING FOCUS

- Eccentric quadriceps and hip abductor strengthening (slow step-downs), keeping the knee in line with the foot.
- Strengthening of the hip abductors and external rotators, and knee control training (knee in line with the foot).
- Single-leg exercises with extra work on the less favourable side, to reduce the difference between sides.

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

Lateral step-down

Keep an eye on

Slow single-leg lowering from a ~20 cm box until the free heel touches the floor beside the box, in front view. It assesses knee valgus, pelvic drop, hip adduction, trunk and depth.

Box height: 20 cm

CAPTURE QUALITY

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

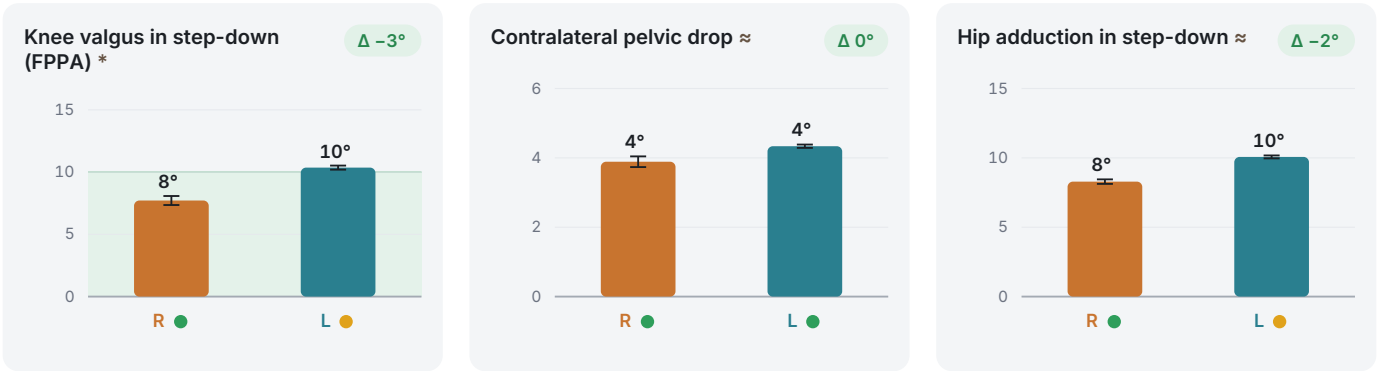
Results

Metric	Right	Left	Asymmetry LSI · R – L	Reference
Knee valgus in step-down (FPPA) *	● 8° ± 0.4	● 10° ± 0.2	● -3°	0–10° Herrington 2014; Munro 2012 (SLS, por analogia); Crossley 2011
Contralateral pelvic drop ≈	● 4° ± 0.2	● 4° ± 0.0	● 0°	No 2D norm: compare sides and progress Crossley 2011; Dingenen 2014
Hip adduction in step-down ≈	● 8° ± 0.2	● 10° ± 0.1	● -2°	No 2D norm: compare sides and progress Crossley 2011
Lateral trunk lean in step-down ≈	● 2° ± 0.1	● 3° ± 0.1	● -1°	No 2D norm: compare sides and progress Crossley 2011; Dingenen 2015
Knee wobble in step-down ≈	● 1.2 % ± 0.1	● 1.3 % ± 0.1	● -0.1 % LL	No 2D norm: compare sides and progress
Step-down depth ≈	● 20 % ± 0.2	● 20 % ± 0.1	● LSI 99 %	No 2D norm: compare sides and progress
Stability index (step-down) *	● 91	● 80	● LSI 88 %	70–100 KINESTA (índice de triagem)

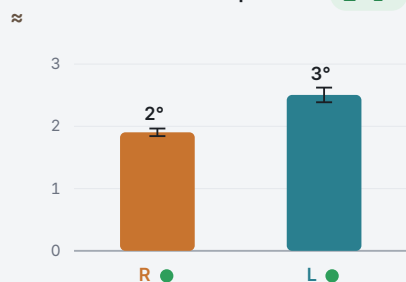
● within reference ● borderline ● outside reference ● no norm (compare sides)
* threshold proposed from published mean ± SD (to be validated)
≈ no reliable 2D norm: compare sides and track over time
Asymmetry: LSI = smaller side ÷ larger side × 100 %; or difference R – L (right – left).
Values: mean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

Right vs left

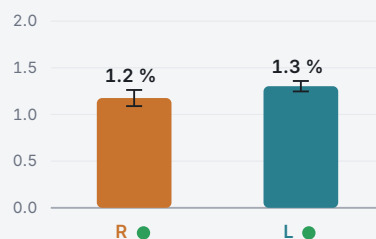
Right Left Reference range



Lateral trunk lean in step-down

 $\Delta -1^\circ$ 

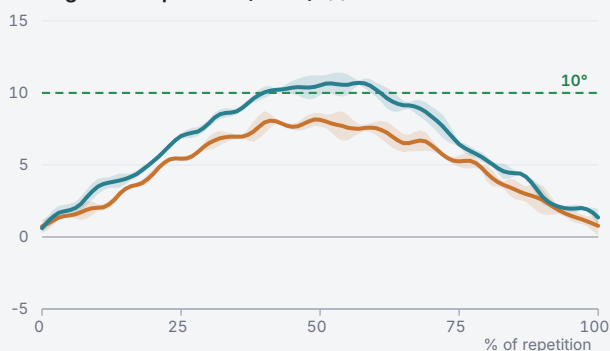
Knee wobble in step-down

 $\Delta -0.1\% \text{ LL}$ 

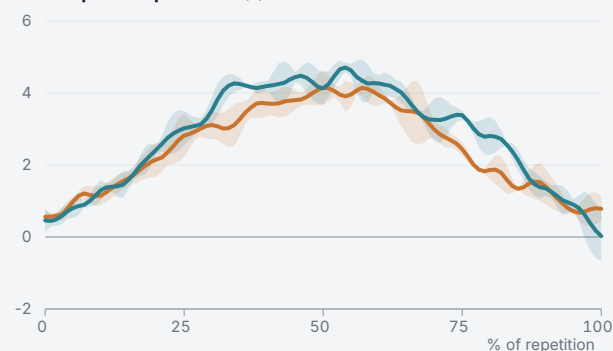
Throughout the movement

— Right — Left — mean $\pm$ SD - - - reference limit

Knee valgus in step-down (FPPA) (°)



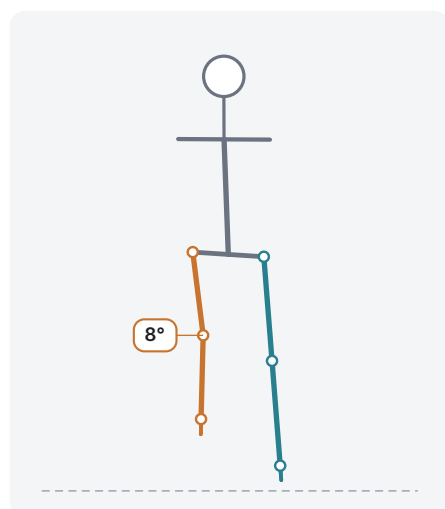
Pelvic drop in step-down (°)



Key positions

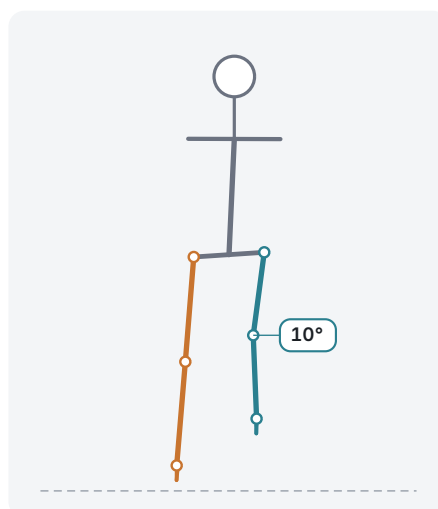
Front view: the client's right side appears on the left of the image.

Step-down: lowest point Right leg



● Knee valgus in step-down (FPPA) · R: 8°

Step-down: lowest point Left leg



● Knee valgus in step-down (FPPA) · L: 10°

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. Stenum 2021. PLoS Comput Biol. doi:10.1371/journal.pcbi.1008935