1 PATIENT & ASSESSMENT DETAILS

CLIENT Mr. Sample Squat	AGE 35 yrs	SEX Male	HEIGHT / WEIGHT · BMI 172 cm / 68 kg · 23.0
CONSENT Obtained – 12/10/2026	ASSESSMENT DATE 12/10/2026	CLINICIAN Dr. A. Sample (PT)	ASSESSMENT Squat Movement Analysis
FRAMES ANALYSED 5 of 5	REPORT ID RX-S20261012-SS-102931	CHIEF COMPLAINT Difficulty squatting fully, right knee stiffness	

2 CLINICAL IMPRESSION

MOVEMENT FINDINGS (FOR CLINICAL INTERPRETATION)

Left–right asymmetry in squat range (right)

With knees bowing outward (varus) (bilateral). Common underlying causes to consider: Unilateral joint restriction (ankle, hip or knee); Pain avoidance or post-injury deficit; Strength asymmetry.

DEPTH – LEFT / RIGHT	STRATEGY – LEFT / RIGHT	WEIGHT SHIFT
Above parallel / Above parallel	Balanced / Balanced Trunk vs tibia inclination	Centred 0.0% of stance width

3 FINDINGS AT A GLANCE

#	FINDING	SIDE	SEVERITY	MATCH
F1	**Left–right asymmetry in squat range** Right side reaches less knee flexion	Right	—	Strongly consistent
F2	**Knees bowing outward (varus)** Knee travels outside the line from hip to foot	Bilateral	—	Consistent

Borderline / possible: Limited squat depth (bilateral).

26 measurements — Normal 22 · Minor 0 · Major 4

4 OPTIONS TO CONSIDER (CLINICIAN DECISION)

F1 **Find and treat the limiting joint on the restricted side**
Left–right asymmetry in squat range · right · EXPERT OPINION

F2 **Check structural alignment before correcting**
Knees bowing outward (varus) · bilateral · EXPERT OPINION

This report is generated from 2D video / photographic measurements and rule-based interpretation against published reference values. Marker placement: manual selection by the assessor (5 frames). Generated by Rollaxis Research & Education Edition for teaching, learning and research only – not for clinical diagnosis or treatment.

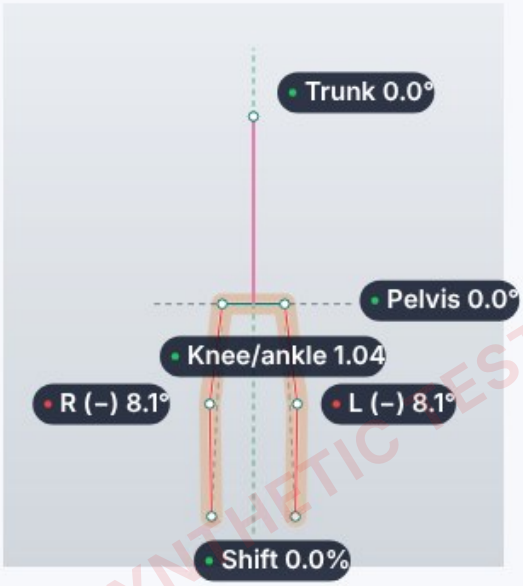
SAMPLE – SYNTHETIC TEST DATA – NOT A PATIENT RECORD

Photographs in this sample show an AI-generated human model – not a real person.

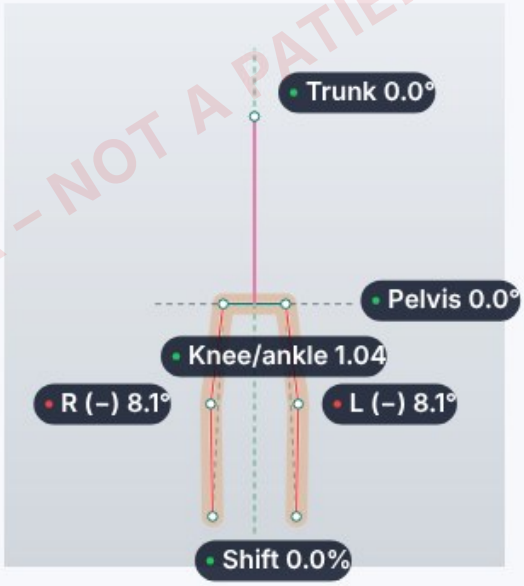
5 FRONT (ANTERIOR) VIEW

MEASURE	MEASURED	REFERENCE RANGE	RESULT
Knee frontal plane projection angle	L: (−) 8.1° R: (−) 8.1°	0° to (+) 8°	L Major 8.1° R Major 8.1°
Knee-to-ankle separation ratio	1.04	≥ 1.00	Normal
Pelvic tilt (side to side)	0.0°	(−) 5° to (+) 5°	Normal
Hip shift (% of stance width)	0.0%	(−) 5% to (+) 5%	Normal
Trunk side lean	0.0°	(−) 5° to (+) 5°	Normal

BOTTOM OF SQUAT



PLUMB LINE



Left knee bows outward (varus) (Major Deviation).
Right knee bows outward (varus) (Major Deviation).
Knees track at or outside the ankles.
The pelvis stays level.
The hips stay centred over the feet.
The trunk stays vertical in the frontal plane.

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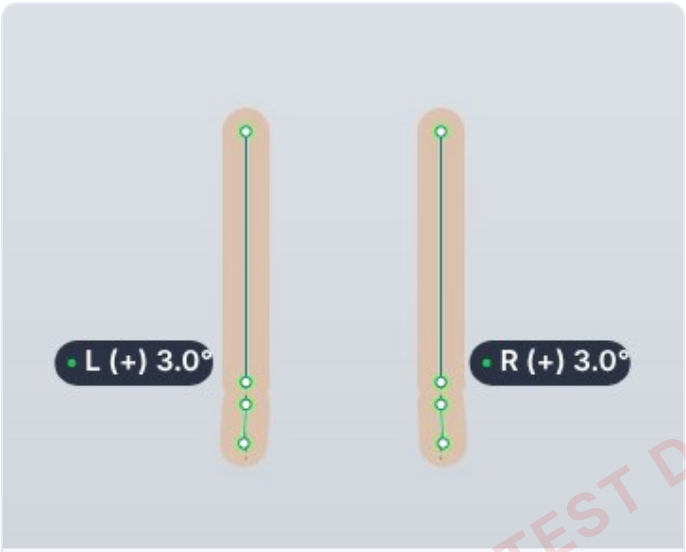
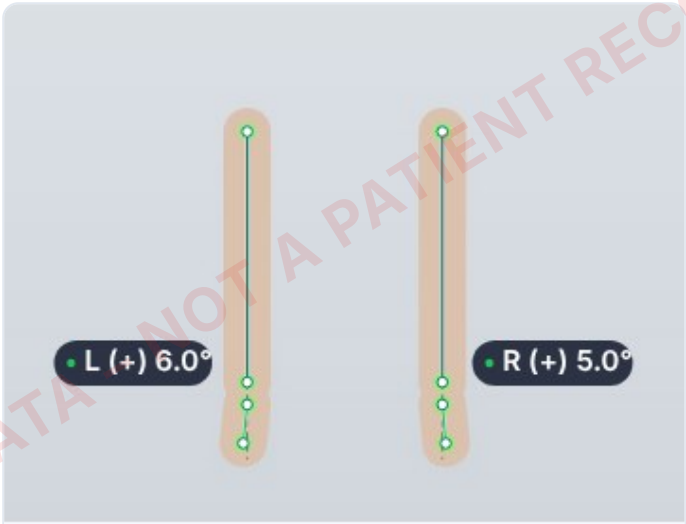
6 BACK (POSTERIOR) VIEW

MEASURE	MEASURED		REFERENCE RANGE	RESULT
Rear-foot angle – standing	L: (+) 3.0°	R: (+) 3.0°	(−) 5° to (+) 5°	L Normal R Normal
Rear-foot angle – bottom of squat	L: (+) 6.0°	R: (+) 5.0°	0° to (+) 12°	L Normal R Normal
Rear-foot change during squat	L: (+) 3.0°	R: (+) 2.0°	(−) 2° to (+) 5°	L Normal R Normal

STANDING



BOTTOM OF SQUAT



Left rear foot alignment in standing is normal.
Right rear foot alignment in standing is normal.
Left rear foot alignment at depth is normal.
Right rear foot alignment at depth is normal.
Left rear foot moves normally during the squat.
Right rear foot moves normally during the squat.

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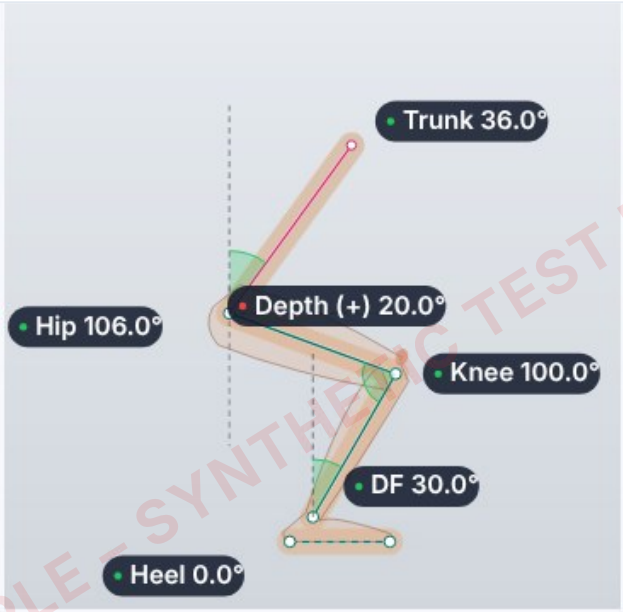
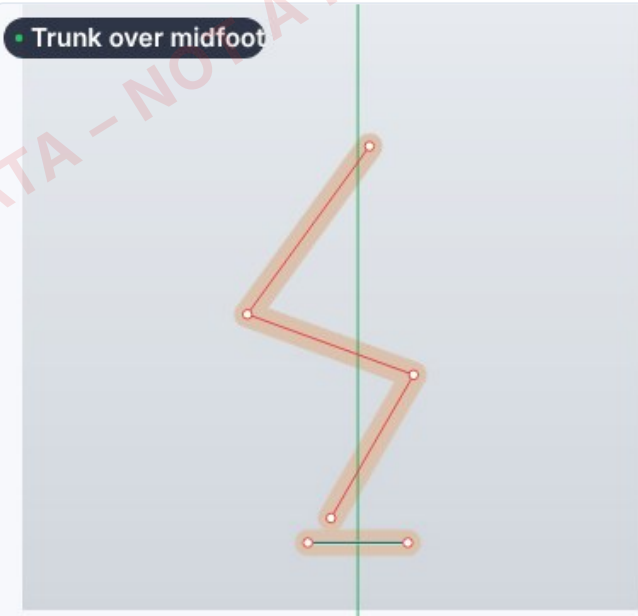
7 RIGHT SIDE VIEW

MEASURE	MEASURED	REFERENCE RANGE	RESULT
Knee flexion	100.0°	≥ 96°	Normal
Hip flexion (trunk–thigh)	106.0°	≥ 77°	Normal
Ankle dorsiflexion	30.0°	≥ 27°	Normal
Squat depth (thigh to horizontal)	**(+) 20.0°**	≤ (+) 5° (at / below parallel)	Major 15.0°
Trunk forward lean	36.0°	≤ 47°	Normal
Trunk – tibia angle difference	(+) 6.0°	(−) 8° to (+) 15°	Normal
Heel lift (foot to floor)	0.0°	≤ (+) 5°	Normal

BOTTOM OF SQUAT



BALANCE LINE (MIDFOOT)



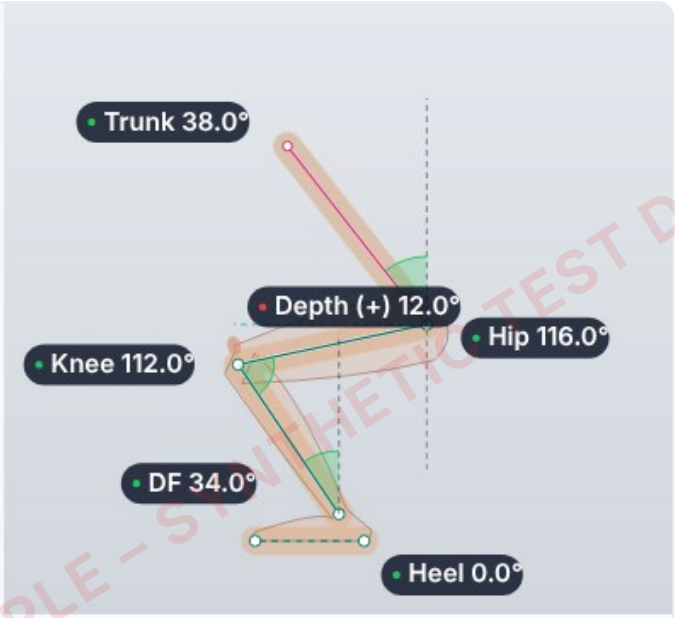
Right knee flexion is adequate at the bottom of the squat.
Right hip flexion is adequate.
Right ankle dorsiflexion is adequate.
Right thigh stays above parallel (limited depth) (Major Deviation).
Trunk forward lean is within the reference range (right view).
Trunk and tibia are close to parallel (right view).
Right heel stays on the floor.

SAMPLE – SYNTHETIC TEST DATA – NOT A PATIENT RECORD

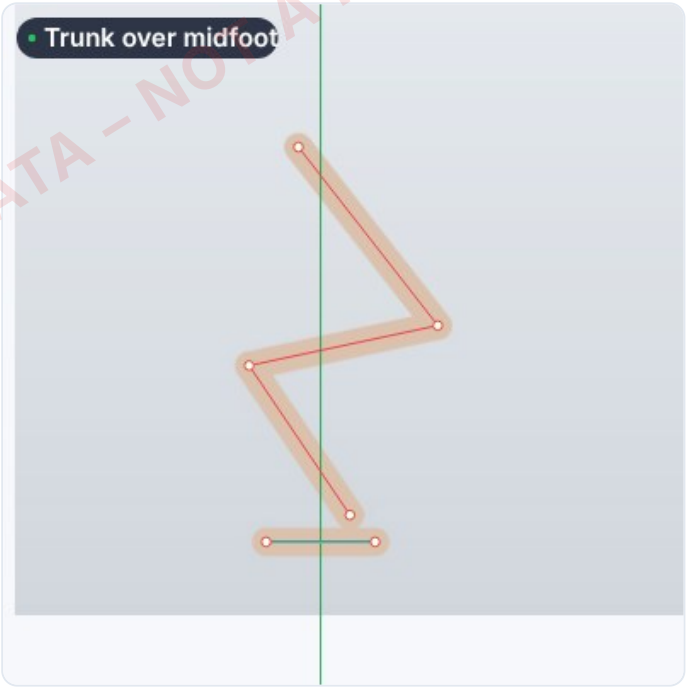
8 LEFT SIDE VIEW

MEASURE	MEASURED	REFERENCE RANGE	RESULT
Knee flexion	112.0°	≥ 96°	Normal
Hip flexion (trunk–thigh)	116.0°	≥ 77°	Normal
Ankle dorsiflexion	34.0°	≥ 27°	Normal
Squat depth (thigh to horizontal)	**(+) 12.0°**	≤ (+) 5° (at / below parallel)	Major 7.0°
Trunk forward lean	38.0°	≤ 47°	Normal
Trunk – tibia angle difference	(+) 4.0°	(−) 8° to (+) 15°	Normal
Heel lift (foot to floor)	0.0°	≤ (+) 5°	Normal

BOTTOM OF SQUAT



BALANCE LINE (MIDFOOT)



Left knee flexion is adequate at the bottom of the squat.
Left hip flexion is adequate.
Left ankle dorsiflexion is adequate.
Left thigh stays above parallel (limited depth) (Major Deviation).
Trunk forward lean is within the reference range (left view).
Trunk and tibia are close to parallel (left view).
Left heel stays on the floor.

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9 ALL MEASUREMENTS AGAINST NORMAL

Anterior











Posterior





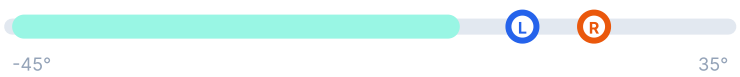


Lateral















● Left ● Right ● Single value ▬ Normal range ○ outside normal

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10 INTERPRETATION & MANAGEMENT

F1 Left–right asymmetry in squat range

Right · Right side reaches less knee flexion

Strongly consistent

One side moves through noticeably less range than the other, so the stronger or more mobile side takes more of the load.
Reported associations in the literature (not an individual risk prediction): Overload of the opposite limb; often a sign of pain avoidance or an unresolved injury

WHAT WE MEASURED

- ✓ Side-to-side difference ≥ 8° in knee, hip or ankle
  Knee flexion: L 112.0° / R 100.0° (Δ 12.0°); Hip flexion (trunk–thigh): L 116.0° / R 106.0° (Δ 10.0°); Ankle dorsiflexion: L 34.0° / R 30.0° (Δ 4.0°)
- – Hip shift to one side

CONSIDER CAUSES

Unilateral joint restriction (ankle, hip or knee) · Pain avoidance or post-injury deficit · Strength asymmetry · Leg-length difference

SUGGESTED CLINICAL EXAMINATION

Compare ankle (lunge test), hip and knee ROM side to side · Single-leg strength tests · Leg-length measurement

TREATMENT OPTIONS (CLINICIAN DECISION)

EXPERT OPINION **Find and treat the limiting joint on the restricted side**

EXPERT OPINION **Unilateral strengthening (split squat, step-up), biased to the weaker side**

EXPERT OPINION **Mirror or two-scale feedback to rebalance load**

F2 Knees bowing outward (varus)

Bilateral · Knee travels outside the line from hip to foot

Consistent

The knees travel outside the line from hip to foot at the bottom of the squat.
Reported associations in the literature (not an individual risk prediction): Lateral knee and ITB loading

WHAT WE MEASURED

- ✓ Knee FPPA below −3° (varus)
  Left knee frontal plane projection angle: (−) 8.1° (ref 0° to (+) 8°)
- ✓ Knee FPPA below −3° (varus)
  Right knee frontal plane projection angle: (−) 8.1° (ref 0° to (+) 8°)
- – Knees much wider than ankles (ratio > 1.4)

CONSIDER CAUSES

Structural genu varum · Over-cueing "knees out" · Supinated / rigid foot · Hip adductor weakness

SUGGESTED CLINICAL EXAMINATION

Standing alignment (intercondylar distance) · Foot Posture Index · Hip adductor strength

TREATMENT OPTIONS (CLINICIAN DECISION)

EXPERT OPINION **Check structural alignment before correcting**

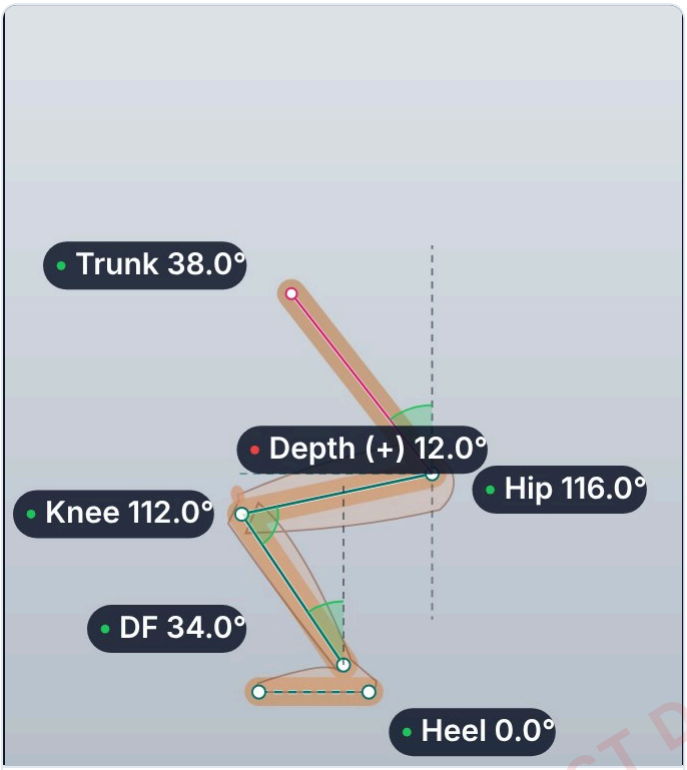
EXPERT OPINION **Cue "knees in line with the 2nd–3rd toe" (avoid over-cueing "knees out")**

EXPERT OPINION **Hip adductor strengthening; foot mobility if the foot is rigid**

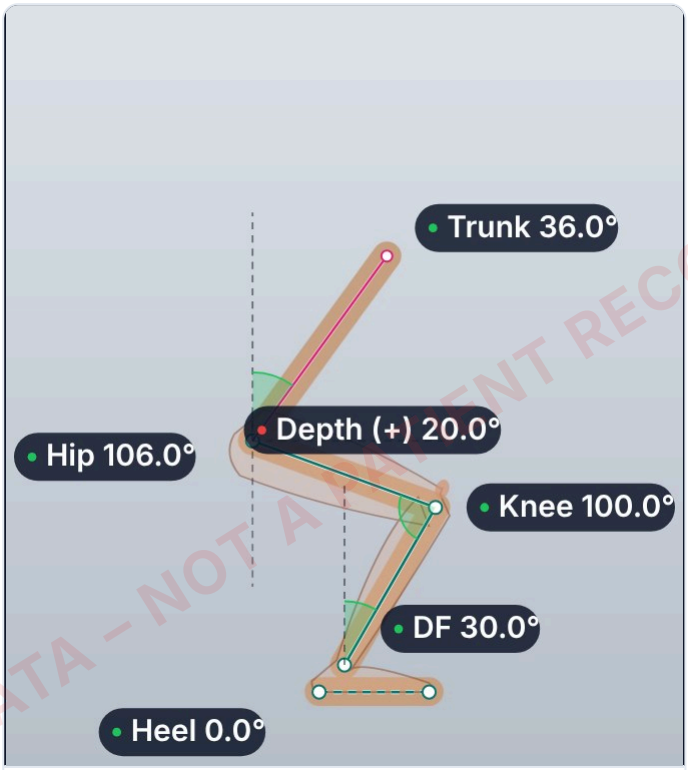
SAMPLE – SYNTHETIC TEST DATA – NOT A PATIENT RECORD

11 PATIENT PHOTOGRAPHS

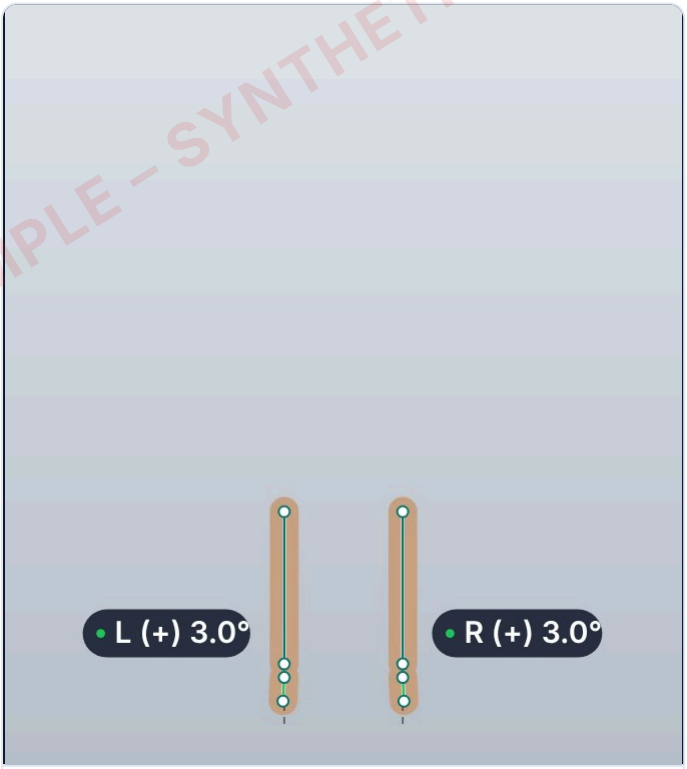
Original frames with the analysis markers, lines and angles drawn on the photograph.



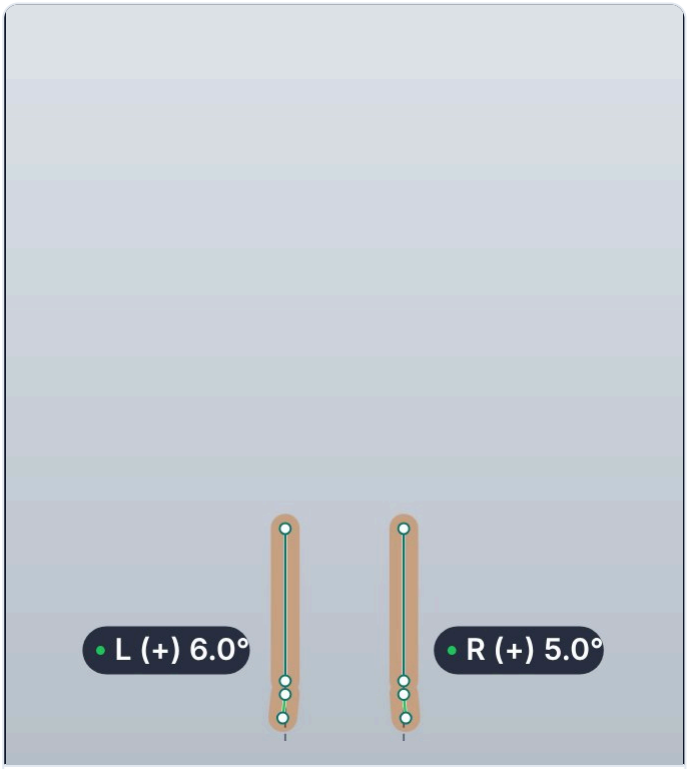
Lateral – Left · Left side – bottom of squat ANNOTATED t = 0.00 s (real time)



Lateral – Right · Right side – bottom of squat ANNOTATED t = 0.00 s (real time)



Posterior · Standing (start position) ANNOTATED t = 0.00 s (real time)



Posterior · Bottom of squat ANNOTATED t = 0.00 s (real time)

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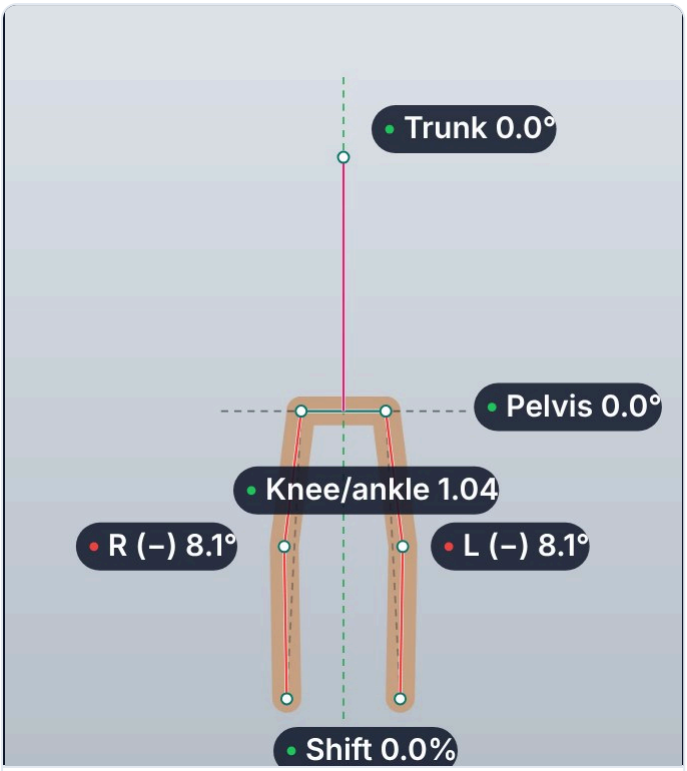

Anterior · Bottom of squat ANNOTATED t = 0.00 s (real time)

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12 POSSIBLE / MINOR PATTERNS

PATTERN	SIDE	KEY FINDING
Limited squat depth	Bilateral	Left squat depth (thigh to horizontal): (+) 12.0° (ref ≤ (+) 5° (at / below parallel))

13 SCREENED AND NOT PRESENT

Restricted ankle dorsiflexion · Limited hip flexion at depth · Excessive forward trunk lean · Knee-dominant squat strategy · Heel rise during squat · Dynamic knee valgus · Excessive dynamic pronation · Supinated / rigid foot · Asymmetric weight shift · Lateral pelvic tilt at depth · Lateral trunk lean

14 NOT ASSESSABLE WITH THIS PROTOCOL

Lumbar flexion ("butt wink") and pelvic tilt in the sagittal plane · hip internal / external rotation (3D) · foot progression (toe-out) angle · speed and control of the movement · single-leg squat

15 HOW TO READ THE ANGLES

Knee flexion 0° = straight. Hip flexion is the trunk–thigh angle (includes some lumbar motion). Ankle dorsiflexion = tibia forward of perpendicular to the foot. Depth: thigh angle to horizontal, (+) hip above knee. Trunk–tibia: (+) trunk more inclined than the shin. FPPA (+) valgus / (−) varus. Pelvic tilt (+) right side lower. Hip shift and trunk lean (+) toward the right. Rear foot (+) eversion / (−) inversion.

16 METHOD

Barefoot bodyweight squat, feet shoulder-width, arms forward, heels down, to maximal depth (2 s pause). Frames at the bottom of the squat from the front and both sides, and at standing and the bottom from behind. Markers placed and verified by the assessor. Frontal-plane differences smaller than about 8° may be measurement error (Munro 2012).

17 REFERENCES

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Evidence labels: **STRONG EVIDENCE** systematic review / RCTs · **MODERATE EVIDENCE** smaller trials or consistent studies · **EXPERT OPINION** clinical consensus.

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18 SUMMARY AND CONCLUSION

Mr. Sample Squat, a 35-year-old male client, underwent squat movement analysis on 12/10/2026 with a chief complaint of “Difficulty squatting fully, right knee stiffness”. Of 26 measurements, 22 (85%) were within normal limits, 0 showed minor and 4 showed major deviation from the reference values. The findings are most consistent with **left–right asymmetry in squat range (right)**, together with knees bowing outward (varus) (bilateral). Contributing factors to examine include unilateral joint restriction (ankle, hip or knee), pain avoidance or post-injury deficit, structural genu varum, over-cueing "knees out".

19 REGIONAL SUMMARY

REGION	STATUS	KEY DEVIATIONS	MEASURES
Trunk	Normal	Within normal limits	5/5 normal
Pelvis	Normal	Within normal limits	2/2 normal
Hip	Major	Depth (L/R)	2/4 normal
Knee	Major	FPPA (L/R)	3/5 normal
Ankle & foot	Normal	Within normal limits	10/10 normal

20 KEY TAKE-HOME POINTS

- Primary finding: **Left–right asymmetry in squat range (right)** – One side moves through noticeably less range than the other, so the stronger or more mobile side takes more of the load.
- 1 finding is bilateral; the others are one-sided – compare with symptoms on that side.
- Reported associations in the literature (not an individual risk prediction): Overload of the opposite limb; often a sign of pain avoidance or an unresolved injury.
- 4 major deviations should be reviewed clinically first.

21 OPTIONS TO CONSIDER (CLINICIAN DECISION)

F1 **Find and treat the limiting joint on the restricted side**
Left–right asymmetry in squat range · EXPERT OPINION

F2 **Check structural alignment before correcting**
Knees bowing outward (varus) · EXPERT OPINION

22 FURTHER ASSESSMENT & FOLLOW-UP

SUGGESTED CLINICAL EXAMINATION

- Compare ankle (lunge test), hip and knee ROM side to side
- Single-leg strength tests
- Standing alignment (intercondylar distance)
- Foot Posture Index

RE-ASSESSMENT

Repeat this analysis at follow-up with the same set-up to measure change; differences smaller than the measurement error (about 5° for 2D joint angles and up to about 8° for frontal-plane knee angles (Munro 2012); 0.10 for ratios; 3% for distances) should not be over-interpreted.

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23 PHYSICAL EXAMINATION & HISTORY

24 FINAL DIAGNOSIS

25 MANAGEMENT PLAN & FOLLOW-UP

RE-ASSESSMENT DUE

REFERRAL TO

Assessed by (name, qualification)

Signature & date

Reviewed by

Signature & date

SAMPLE – SYNTHETIC TEST DATA – NOT A PATIENT RECORD

26 PATIENT CONSENT RECORD

Consent given by	Mr. Sample Squat
Date & time recorded	12/10/2026, 09:05:00
Recorded by	Dr. A. Sample (PT)
Purpose	Video / photographic recording and computer-assisted analysis of movement and posture for teaching, learning and research.
Use of anonymised data in teaching materials / publications	Not agreed

27 INTENDED USE

For research and education use only. Rollaxis is not a medical device. Its measurements, interpretations, provisional diagnoses and management options are teaching and research examples and must not be used to diagnose or treat any person.

Rollaxis Research & Education Edition is software for teaching, learning and research in human movement science. It measures two-dimensional (2D) joint and segment angles, timing and alignment from video recordings and photographs of posture, walking, running, a bodyweight squat and the Landing Error Scoring System (LESS) jump-landing task, using skin markers placed and confirmed by the user, and compares the measurements with published reference values. To support teaching, its reports also show worked examples of clinical reasoning – interpretation of the findings, provisional diagnoses and management options with their published evidence – generated by fixed rules from the literature. It is intended for students, educators and researchers in physiotherapy, sports science and medicine, in teaching laboratories, classrooms and approved research studies. It is not a medical device and is not intended for the diagnosis, prevention, monitoring, treatment or alleviation of any disease, injury or disability in an individual; its output must not be used as the basis for clinical decisions.

28 WARNINGS AND LIMITATIONS

Measurements are 2D projections of 3D movement and are affected by camera position, height, distance and tilt, lens distortion, patient rotation, clothing, frame rate and marker placement; rotations about the long axis of the limb are not measured. Check every marker, including automatic suggestions, before using a value. Differences smaller than the measurement error should not be interpreted as change. Reference values come from published adult populations and may not apply to every patient; they are not paediatric values. Stop the test if the patient reports pain, dizziness, chest discomfort or instability. Rule-based interpretations, provisional diagnoses and management options are teaching examples, not clinical advice. Use only the version supplied by the publisher on a computer protected as described in the user manual.

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29 PERSONAL DATA PROTECTION (DIGITAL PERSONAL DATA PROTECTION ACT, 2023)

Sample Physiotherapy Clinic is the **Data Fiduciary** for the personal data in this report, including images and health information. The data were collected with the consent recorded above, for the specified purpose only, and are stored on the institution's computer. Rollaxis does not transmit patient data; licence activation sends only the licence key, a computer identifier, the computer name and the software version to the publisher's licence server. The data principal (patient) may withdraw consent at any time, and may request access to, correction of or erasure of their personal data, or raise a grievance, by contacting Sample Physiotherapy Clinic. Withdrawal does not affect processing done before it. Data are kept only as long as needed for this purpose or as required by law for clinical records. For a child (under 18 years), verifiable consent of the parent or lawful guardian is required.

30 RESPONSIBILITIES

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31 USER DECLARATION

I confirm that the participant gave consent, that I have reviewed the measurements in this report, and that this report was produced for teaching, learning or research and will not be used as the basis for diagnosis or treatment of the participant.

Name, designation & institution

Signature & date

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