Knee extension force, with and without Q-Technology

Instrumented pilot study (athlete, anonymized subject) — Q-Alpha circuit, measured across two days

Level of evidence : Observed in-house — pilot study (n = 1), documented circuit (Q-Alpha), two-day design (no cumulative fatigue)

Study type	Exploratory pilot, within-subject, paired comparison without Q vs with Q
Participant	An athlete (anonymized subject)
Device	Kinvent Physio dynamometer (ref. M124240), 500 Hz sampling
Movement	Knee extension at 90° flexion, seated
Q circuit	Q-Alpha
Task	Maximal voluntary isometric contraction — 3 trials/condition, best of 3 retained
Conditions	Without Q circuit (day 1, evening), then with Q-Alpha (day 2, morning) — two separate days
Primary outcomes	Peak force per side · left/right asymmetry

Summary

Fourth measurement in the Kinvent series, with a documented circuit (Q-Alpha). In this athlete, knee extension force rises mostly on the WEAK side: +14% on the left (the lagging side), versus +2% on the right (the already-strong side, which barely moves). Left/right asymmetry is cut in half (peak 17.7 → 8.2%; mean 15.7 → 7.0%). Design strength: the two conditions were run on two separate days — no cumulative fatigue from a back-to-back series. Exploratory result on a single subject, to be replicated.

1. Background and objective

Previous cases in the series had shown an effect that goes first to the weak side. This measurement asks the same question on another subject — and adds two safeguards: the circuit used is this time documented (Q-Alpha), and the two conditions are a night apart, which removes the cumulative fatigue of a back-to-back series.

The answer confirms the pattern: the weak side rises clearly, the strong side barely, and the gap closes.

2. Method

Standardized protocol, instrument-read measurements:

- Participant: an athlete (anonymized subject), one measurement per condition.
- Device: Kinvent Physio dynamometer (ref. M124240), 500 Hz.
- Movement: knee extension at 90° flexion, seated.
- Task: maximal voluntary isometric contraction (MVC) against the dynamometer.
- Q circuit: Q-Alpha (documented).
- Repetitions: 3 per condition; the software keeps the best of 3.
- Conditions: without Q circuit (day 1, evening), then with Q-Alpha (day 2, morning) — fixed order, on two separate days (no cumulative fatigue).

- Measures: peak force (L, R), peak and mean asymmetry, rate of force development (RFD), time to peak.

3. Results

OBSERVATION Force increase concentrated on the weak side, and asymmetry reduction — measured on the instrument.

Measure (Kinvent, best of 3)	Without Q	With Q	Reading
Peak force — left (weak side)	51.1 kg	**58.2 kg**	+14%
Peak force — right (strong side)	62.0 kg	63.4 kg	+2%
Peak-force asymmetry	17.7%	**8.2%**	~2× lower
Mean-force asymmetry	15.7%	**7.0%**	~2× lower
RFD (rise rate) — L / R	37.4 / 50.5 kg/s	23.3 / 22.2 kg/s	slower
Time to peak — L / R	2.1 / 2.3 s	4.0 / 3.1 s	longer rise

Peak force rises mostly on the weak side: +14% on the left (51.1 → 58.2 kg), while the already-strong side barely moves (+2% on the right, 62.0 → 63.4 kg). The effect does not push both sides equally — it mostly lifts the lagging side.

Direct consequence: the left/right asymmetry is cut in half, on peak (17.7 → 8.2%) and on the mean (15.7 → 7.0%). The baseline imbalance closes.

4. The effect targets the weak side

We find here the pattern already seen elsewhere in the series: the gain concentrates on the weak side, and the strong side — which has little to catch up — stays nearly stable. The effect seems to target the weak link rather than uniformly amplifying force.

This behavior is itself a clue: a general amplification would have raised both sides; here it is the lagging side that responds, and the gap closes.

5. A design that reduces possible confounds

A particular feature of this measurement: the two conditions were not run back-to-back in the same session, but on two separate days (without in the evening, with the next morning). This removes a common confound — the cumulative fatigue of a series of maximal efforts, which would lower the second condition.

In return, this design introduces a time-of-day variation (evening vs morning). That is a limitation — but it works AGAINST the result rather than for it: peak force is often slightly higher in the evening. Yet here the gain is observed in the morning, with Q. The time shift therefore cannot explain the gain; it would more likely make it harder to see.

6. Interpretation

As often in the series, not everything increases: the rate of force development (RFD) drops and time to peak lengthens (2.1 → 4.0 s on the left). Fair reading: force rises more gradually toward a higher peak, rather than all at once. The solid message stays “stronger, more balanced” — not “more explosive.”

This asymmetry reduction, concentrated on the weak side, echoes in measured force the normalization observed elsewhere in the series.

7. Limitations

- n = 1, one measurement per condition (best of 3).
- Fixed order (without then with), and different times of day (evening vs morning) → possible circadian variation (which would tend to work against the observed gain).
- Non-blinded condition, no sham circuit.
- A single joint (knee extension); to be confirmed on other movements.

8. Next steps

- Repeat with alternating order and a sham circuit placed by a third party (blinded).
- Standardize the time of day for both conditions.
- Track the dual signal: weak-side gain + asymmetry closing.
- Extend to several subjects and several joints.

9. Conclusion

Fourth instrumented case, same direction: peak force rises mostly where it was lacking, and left/right asymmetry is cut in half. Two elements strengthen the reading — a documented circuit (Q-Alpha) and a two-day design that removes cumulative fatigue, with the only time-of-day variation working against the gain. It remains to be confirmed blinded and across several subjects. Framing: an exploratory pilot study, to be replicated, with no medical claim.

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Source: Kinvent Physio report (M124240, 500 Hz), knee extension 90°, Q-Alpha circuit, best of 3 trials. Anonymized subject. Unaudited internal data. Not a medical claim.