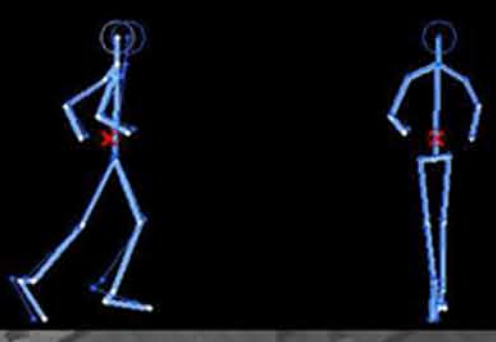
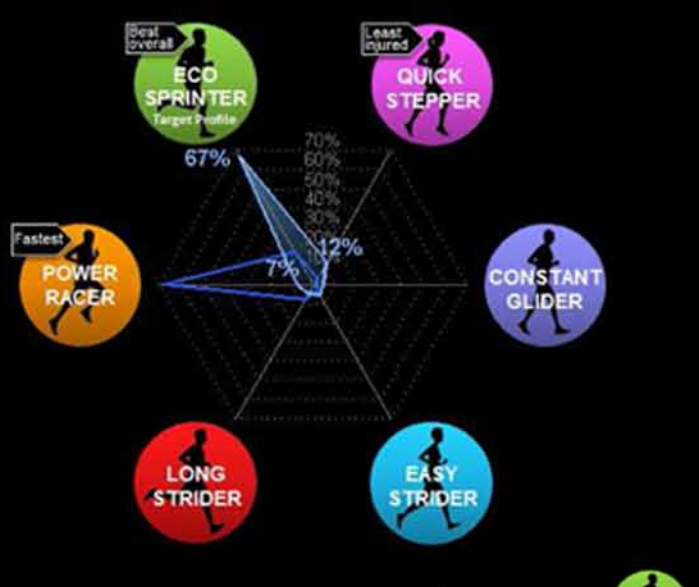
Test results for Nik Kershaw

Date: 07 Jul 2021 Time: 10:53 AM Speed: 12 km/h





Your profile

Our e-coach says:

This is the target profile, towards which you are guided by the green elite range fields and the stride rating score. It shows the best performance across the full long distance range taking into account also injury risk. Main focus can be put on optimising endurance and addressing any individual gait anomalies.

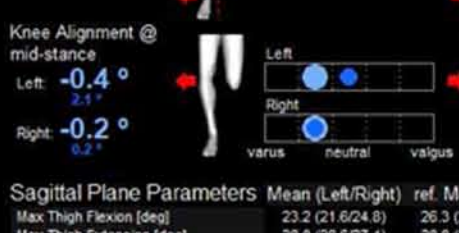
Note from your service provider:

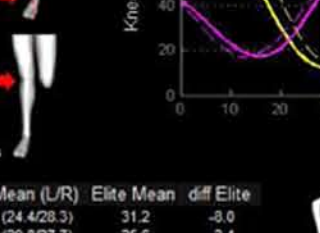
No note written

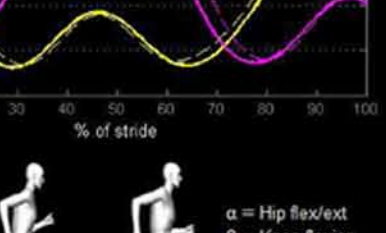
Test results for Nik Kershaw

Date: 07 Jul 2021 Time: 10:53 AM Speed: 12 km/h

RUNNING PERFORMANCE @ 12 km/h



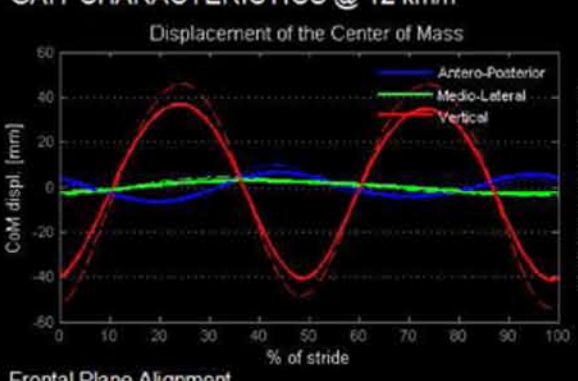




Test results for Nik Kershaw

Date: 07 Jul 2021 Time: 10:53 AM Speed: 12 km/h

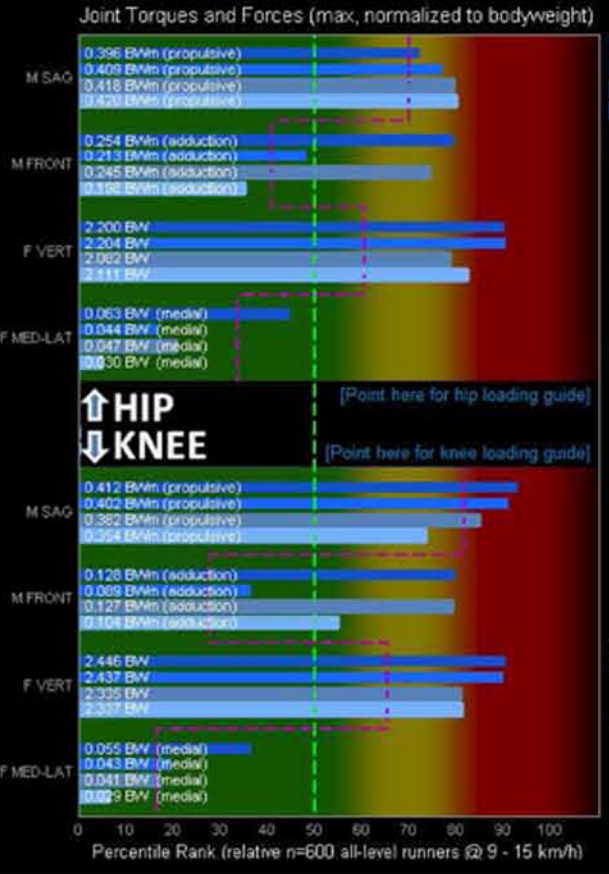
GAIT CHARACTERISTICS @ 12 km/h

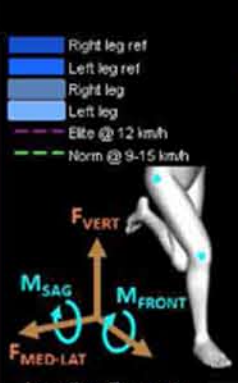


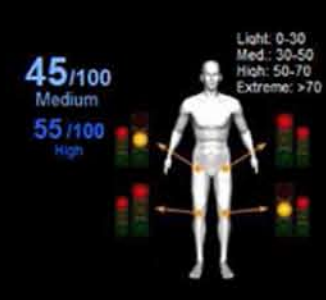
Sagittal Plane Parameters	Mean (Left/Right)	ref. Mean (L/R)	Elite Mean	diff Elite
Max Thigh Flexion [deg]	23.2 (21.6/24.8)	26.3 (24.4/28.3)	31.2	-8.0
Max Thigh Extension [deg]	28.0 (28.6/27.4)	28.8 (29.8/27.7)	25.6	2.4
Shank angle @ touch-down [deg]	-3.0 (-2.4/-3.6)	-3.0 (-2.2/-3.9)	-0.6	-2.4
Knee Flexion @ touch-down [deg]	16.3 (14.6/18.1)	15.6 (14.1/17.1)	16.9	-0.6
Max Knee Flexion @ stance [deg]	40.2 (36.8/43.6)	39.5 (35.8/43.2)	37.1	3.0
Max Knee Flexion @ swing [deg]	86.6 (84.0/89.3)	107.6 (100.7/114.6)	103.1	-16.4
Symmetry Rating	★★★★☆	★★★☆☆		

Date: 07 Jul 2021 Time: 10:53 AM Speed: 12 km/h

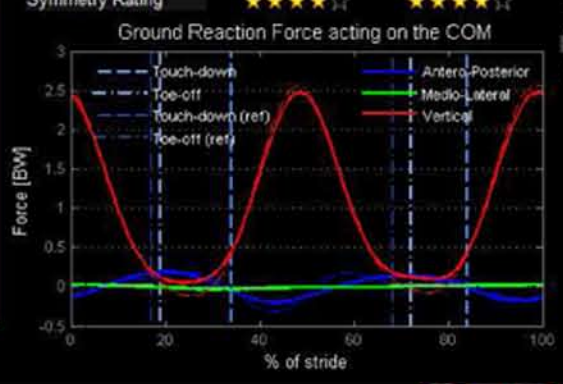
JOINT LOADING @ 12 km/h







Loading Property	value	ref. value
Max loading @ joint	Right Knee (M SAG)	Right Knee (M SAG)
Left/right preference [%]	47.9/52.1	47.6/52.4
Bilateral asymmetry [%]	4.6	5.2
Symmetry Rating	★★★★☆	★★★★☆



Loading vs stride parameter dependence

Hip Sagittal Moment [M SAG]
- increases with Max hip extension
- decreases with Overstride
- decreases with Forward lean

Hip Frontal Moment [M FRONT]
- decreases with Step width
- increases with Vertical displacement

Hip Vertical Force [F VERT]
- increases with Vertical displacement
- increases with Knee flex @swing
- decreases with Cadence

Hip Mediolateral Force [F MEDLAT]
- increases with Step width
- increases with Body length

Knee Sagittal Moment [M SAG]
- decreases with Shank angle @landing
- increases with Knee flex @landing
- increases with Vertical displacement

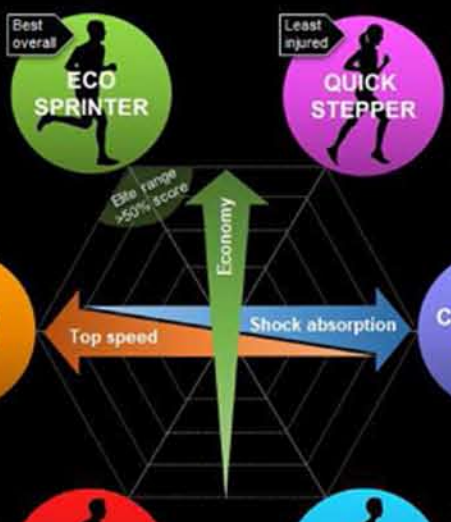
Knee Frontal Moment [M FRONT]
- decreases with Step width
- increases with Knee varus alignment
- decreases with Cadence

Knee Vertical Force [F VERT]
- increases with Vertical displacement
- increases with Max knee flex @swing
- decreases with Cadence

Knee Mediolateral Force [F MED-LAT]
- increases with Shank angle @landing
- increases with Step width

Quick Reference Guide – Runner Profiles

- MotionMetrix's target profile for optimal long-distance performance (green elite range fields in app)
- Active compact stride with great elastic bounce
- Best compromise between speed capacity, running economy and injury risk
- Very common profile among elite 5 - 42k runners
- Next lowest injury risk after Quick Steppers



- Rapid footwork with good elastic bounce
- Good economy up to ~16 km/h that then drops due to excessive leg velocity (work to move the segments)
- Gentle loading due to small joint angles and peak forces
- Many top ultra runners and female marathoners belong to this category
- The least injured category among all six

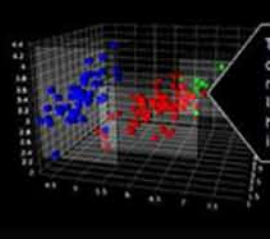
- Profile with highest top speed, very common among middle-distance elite runners
- Long powerful strides with short ground contact
- Stiff springy legs yielding great elastic bounce
- Large vertical peak force acting on the joints
- Highest injury risk, tough on lower leg and calf due to extreme ankle joint power generation

- Short strides with nearly constant ground contact
- Mild joint loading but limited bounce that prevents fast running
- Common among runners with limited flexibility, elasticity or strength
- Many elderly runners in this category
- Slowest category but among the least injured

- Long leaping strides powered by large muscular force
- Excessive overstride and ground contact time
- Common style among strong athletically built runners and mostly male
- Decent sprint capabilities but poor economy due to excessive braking/propulsion
- Next highest injury risk, tough on the knees

- Easygoing style, follows the law of least resistance
- Most common profile among all six
- Characterized by overstride and a tendency to a seated posture
- Soft knee during support, sensitive to different footwear
- Low to average speed capacity and running economy at medium injury risk

Occurrence	6.3%	22.9%	12.8%	11.6%	29.6%	16.80%
10k race time (mean)	40:12	43:42	45:50	49:30	46:30	45:12
10k race time (top 10%)	30:23	32:29	36:15	41:12	36:06	37:20
Injury rate (2 years)	84%	62%	59%	64%	75%	77%
Primary injury sites	1) lower leg 41%	1) knee 27%	1) knee 46%	1) knee 52%	1) knee 35%	1) knee 37%
	2) calf 28%	2) foot 21%	2) lower leg 24%	2) lower leg 21%	2) achilles 17%	2) hamstrings 17%
	3) knee 22%	3) lower leg 15%	3) calf 23%	3) achilles 17%	3) hamstrings 16%	3) hip 15%
Shoe pref. (light/stable)	75%/25%	63%/37%	55%/45%	30%/70%	15%/85%	10%/90%
Distr (men/women)	55%/45%	44%/56%	39%/61%	31%/69%	61%/39%	65%/35%



The six fundamental runner profiles have been derived by cluster analysis on a large bio-mechanical dataset (N > 1000) of runners. Information about performance and injuries have subsequently been obtained from interviews with runners belonging to the set.