Moving Performance Forward by Running Backward

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Locomotion Bias?

EBSCOHost Search
BR ≈ 18 studies vs Sprint ≈ 6500 studies

Player Tracking Over a Soccer Match
BR (+4m/s) ≈ 3-5% vs Sprint ≈ 0.8-1.4% 1,2

Sprinting and BR ≈ 1.5s
Not All Backward Running is Created Equal
Pedal vs Run
Why Run Backwards? Energetic and Biomechanical Rationale
\( \downarrow \) running speed
≈ 70\% \text{ of FR} \ 7, 8

\( \downarrow \) stress on knee joint \ 9-11

Ground reaction forces experienced closer to toes \ 10

\( \uparrow \) aerobic demand
\( \uparrow \) anaerobic demand \ 3-6

\( \uparrow \) total muscle activation of
- Quadriceps
- Hamstrings
- Gastrocnemius
- Tibias anterior \ 12, 13

\( \uparrow \) rate of force development \ 13
\( \uparrow \) vertical leg stiffness \ 14
\( \downarrow \) peak vertical GRF \ 8, 15

\( \uparrow \) stride frequency \ 4, 6-8, 16

\( \downarrow \) stride length \ 6-8, 13, 16
Current Research

- Autoregulation to self select running velocity

- FR = (CV = 1.00 – 4.24, ICC = 0.92 – 0.98)

- BR = (CV = 0.99 – 3.63, ICC = 0.96 – 0.99)

- Reliability of Resisted BR and FR

- Step kinematics and Muscle activity of unresisted and resisted BR and FR

- Effects of 8-week unresisted BR training program versus FR and Control

- Effects of 6-week resisted BR training program versus FR and Control
Backward Running: Technical Considerations
Minimize Stance Leg Knee Flexion

Utilize Upper Limbs

Exaggerate Swing Leg Knee Flexion

Emphasize Hip Extension

Minimize Stance Leg Knee Flexion

Minimize Ground Contact Time

Rapid and Full Stance Leg Extension
References

Thank You!

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