



@physicaltherapyresearch

RAPID RESEARCH

April 2021

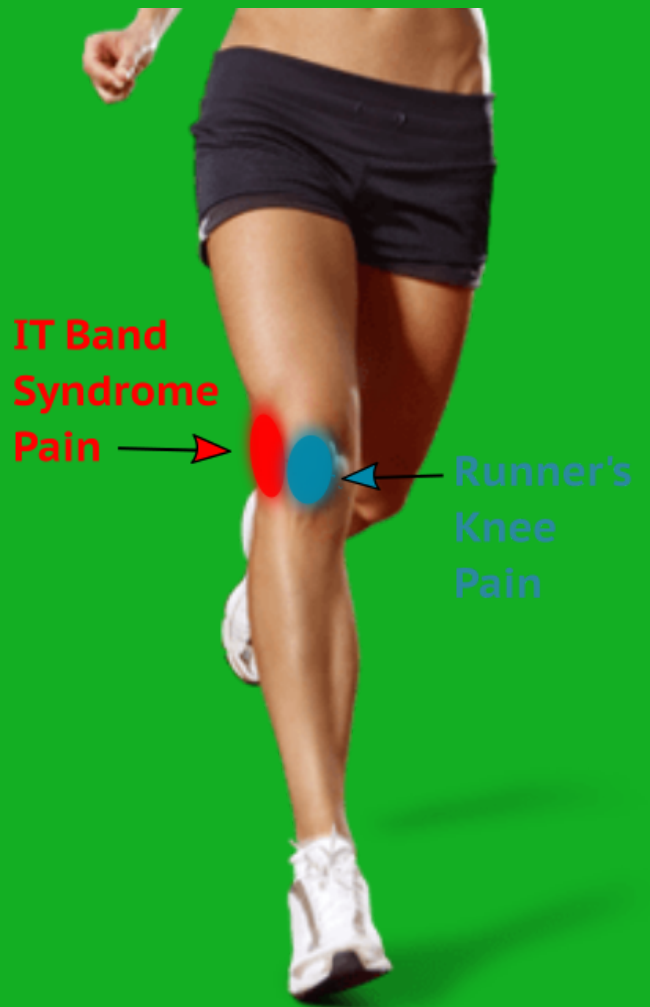
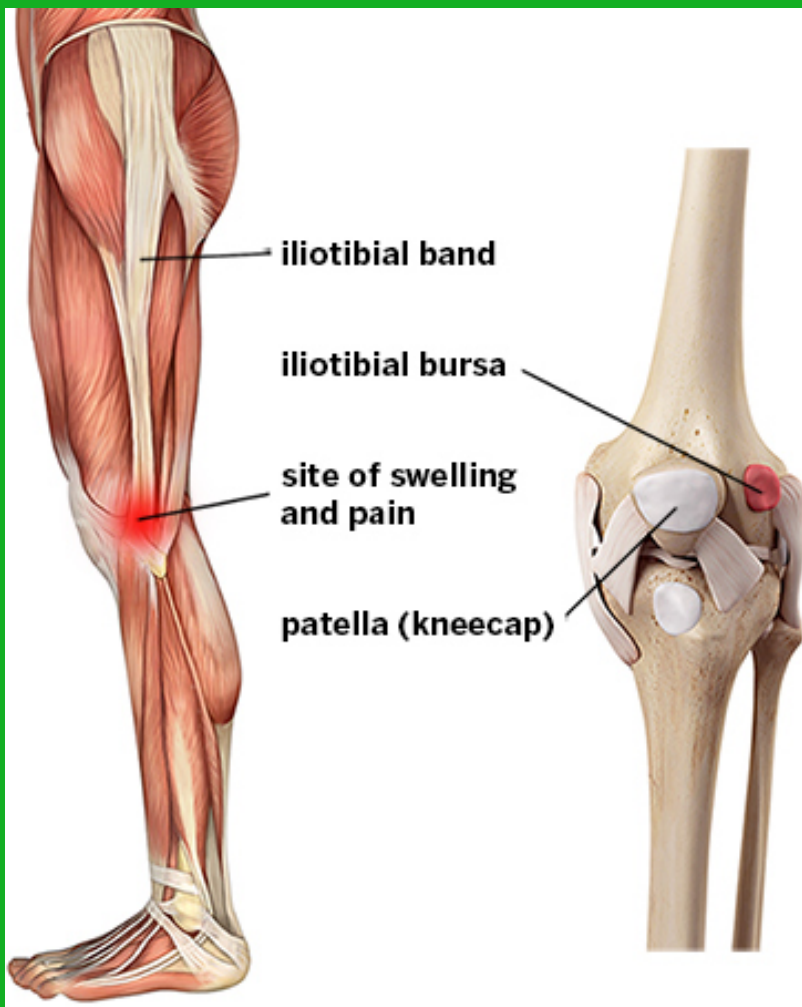
Inside This Week: Running Pains & Injury

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- ✓ IT Band Pain and Runners
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- ✓ Foot Strike Type and Achilles Load During Running
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- ✓ Step Rate & Patellofemoral Pain in Runners



IT BAND PAIN AND RUNNERS

This research explored the potential factors that contribute to Iliotibial Band Syndrome development in runners as (ITBS) is the 2nd leading cause of pain in runners & accounts for ~10% of running-related injuries.



KEY FINDINGS

3 main causes of ITBS related symptoms have been theorized, including:

- Friction of the IT band on the lateral femoral condyle.
- Compression of a fat pad near the IT band distal attachment.
- Inflammation of the IT band bursa.

-

□

An impingement happens at ~30 degrees of knee flexion, which creates an inflammatory response and subsequent pain.

□

Similar to the friction theory, however the irritated fat pad produces pain at the lateral knee.

□

The bursa becomes inflamed from repeated friction, however, the presence of the IT band bursa is inconsistent based on cadaver studies.

MAIN TAKEAWAYS

Factors thought to contribute to ITBS were examined, including:

Decreased muscle strength/endurance:

[Findings contradictory or inconclusive]

Strain Rate of Hip Abductors:

[Weak Correlation]

Knee Valgus during stance phase:

[Weak Correlation]

Reduced rear foot eversion at Heel-Strike:

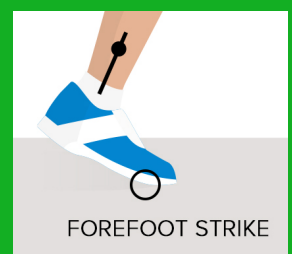
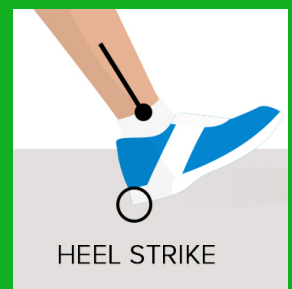
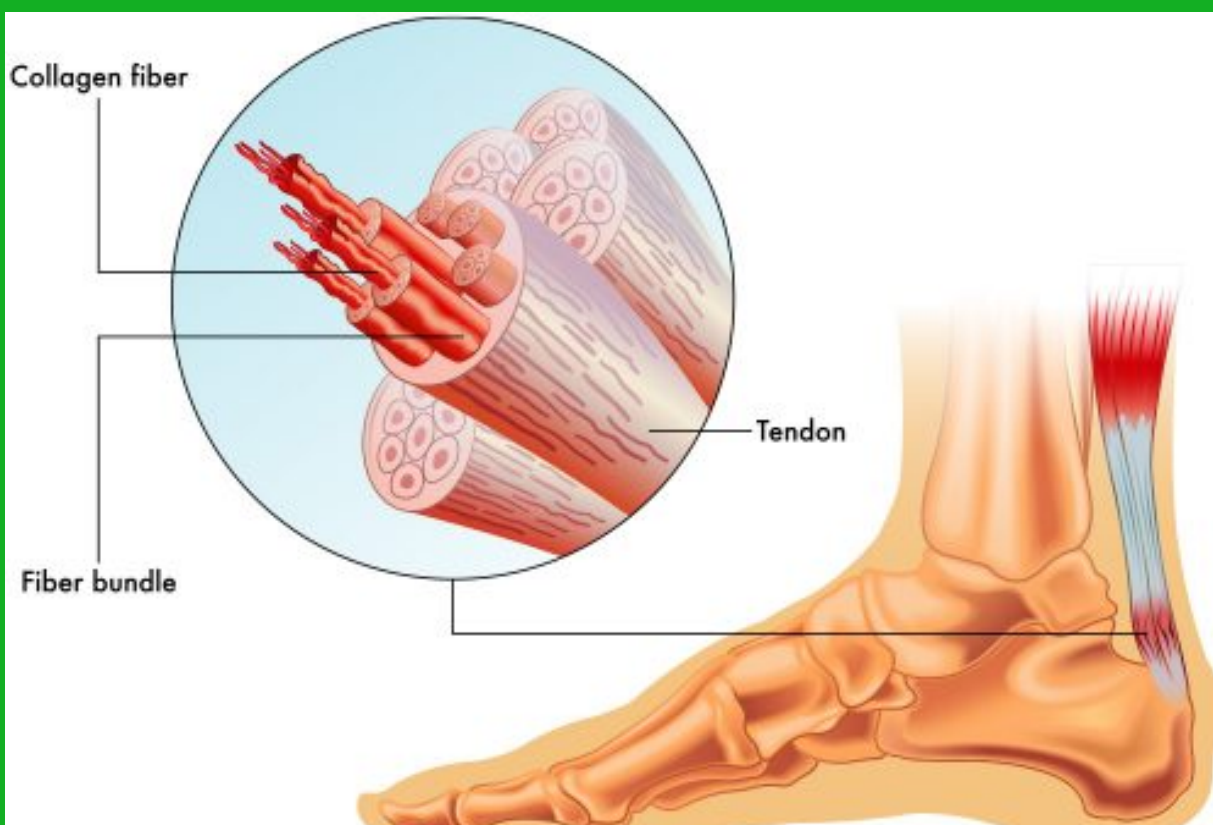
[Weak Correlation]

Hip adduction angle in stance phase:

[Weak Correlation]

FOOT STRIKE TYPE & ACHILLES LOAD DURING RUNNING

This research investigated the influence of both foot strike and footwear on Achilles tendon loading, as it is the strongest tendon in the human body but is the most common site of tendon overload injury.



KEY FINDINGS

Achilles Tendon Force:

Not significantly influenced by **foot strike** or **footwear**.

Lower in **standard shoes** than in **minimal shoes** or **barefoot**, regardless of foot strike.

Achilles Tendon Impulse:

Significantly greater impulse with Fore Foot (FFS) vs. Rear Foot Strike (RFS) in **minimal shoes**, but **not in standard shoes** or **barefoot**.

Ankle Dorsiflexion Angle:

Touchdown angle greater with RFS vs. FFS in **all footwear conditions**.

Peak Ankle Dorsiflexion Angle:

Higher with RFS vs. FFS.

No effect found with footwear.

Ground Reaction Force Loading Rates:

RFS:

Loading rates **increased** from **standard shoes** to **minimal shoes** to **barefoot**.

FFS:

Loading rates lower in standard shoes than minimal shoes or barefoot, but were **not different** between **minimal shoes** and **barefoot**.

GRF loading rates **higher with RFS than with FFS** in **all footwear** conditions.

Step Length:

Longer with RFS vs. FFS.

Longest in standard shoes and shortest when barefoot.

MAIN TAKEAWAYS

Greater tendon impulse with a FFS vs. RFS in minimal shoes.

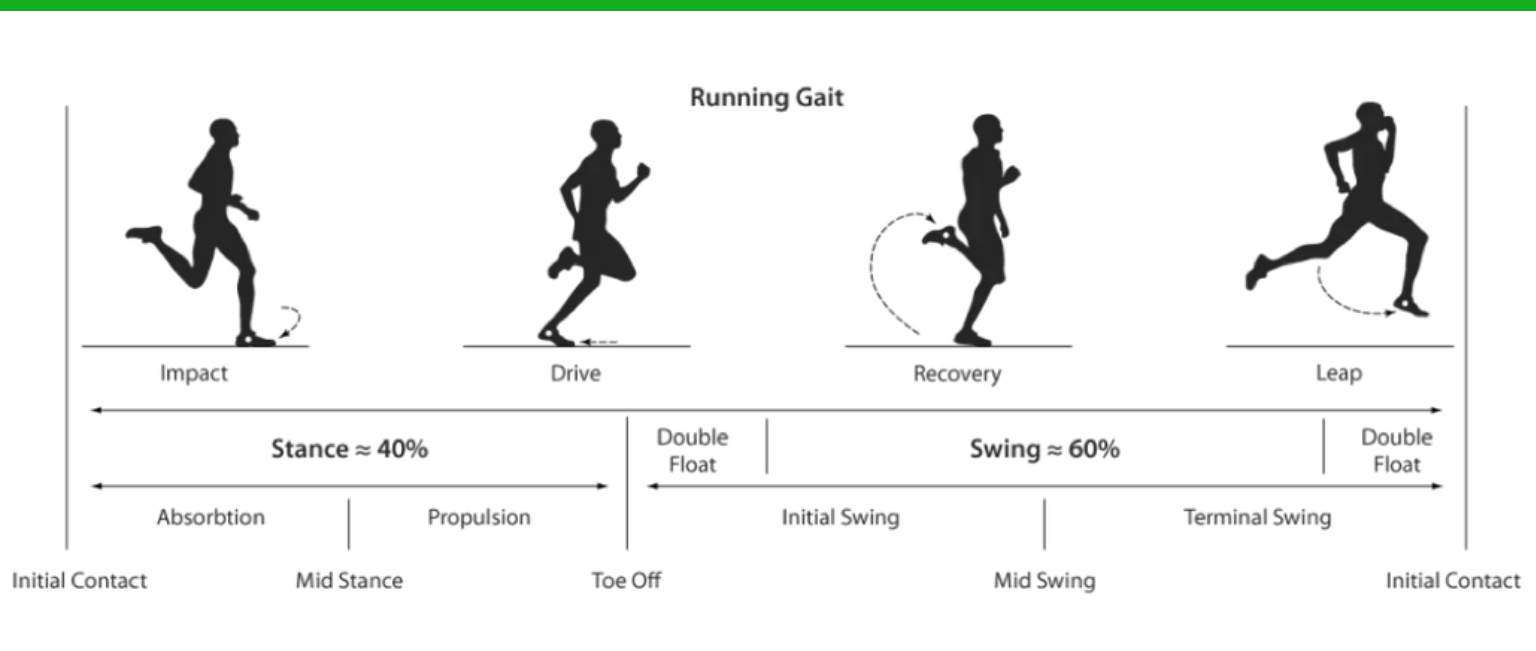
Higher tendon loading rates in minimal shoes or barefoot than in standard shoes.

Running with a FFS or in minimal shoes or barefoot, may increase the risk of Achilles tendinopathy.

Transitioning to FFS running and/or running in minimal shoes or barefoot should be done progressively.

STEP RATE & PATELLOFEMORAL PAIN IN RUNNERS

This study investigated whether a 10% increase in the running step rate influences frontal-plane kinematics of the hip and pelvis as well as clinical outcomes in runners with PFJP.



KEY FINDINGS

Significant improvements in running kinematics and clinical outcomes were observed at **4-week and 3-month follow-up**.

Significant reductions were observed in:

Peak contralateral **pelvic drop**

Hip adduction

Knee flexion

Significant increases were found in:

Self-reported weekly **running volume**

Longest run **pain-free**

Significant Improvements were found in:

Worst pain in the past week.

Lower Extremity Functional Scale.

MAIN TAKEAWAYS

For runners with PFJP, a 10% increase in step rate resulted in significant improvements for:

Running kinematics.

Pain.

Function.

These improvements were maintained at 3-month follow-up.

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We would greatly appreciate any feedback you have, as it helps us continually improve!

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