# Flex Therapist CEUs

## Barefoot Running Considerations

### Variation in Foot Strike Patterns among Habitually Barefoot and Shod Runners in Kenya

**1. It is widely observed that more than 85% of habitually shod runners typically:**

A. Forefoot strike
B. Midfoot strike
C. Rearfoot strike
D. Foot strike patterns have been observed to be equally distributed among shod runners

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**2. Numerous studies have found that barefoot and minimally shod runners are more likely than habitually shod runners to do all of the following, except:**

A. Forefoot strike
B. Midfoot strike
C. Rearfoot strike
D. Barefoot and minimally shod runners have the same striking pattern as habitually shod runners

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**3. People in minimal shoes are more likely to run with a forefoot strike than those who are barefoot.**

A. True
B. False

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**4. Impact peaks can be uncomfortable, often causing barefoot runners to avoid rearfoot strike landings on hard surfaces without a cushioned shoe.**

A. True
B. False

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**5. All people _____ when running up a steep incline.**

A. Forefoot strike
B. Midfoot strike
C. Rearfoot strike
D. There is high variability in strike pattern when running up a steep incline

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**6. Runners are more likely to midfoot strike or forefoot strike as they increase speed.**

A. True
B. False

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**7. Habitually shod people who normally rearfoot strike typically switch to midfoot strike when asked to run barefoot on hard surfaces such as asphalt, but often continue to rearfoot strike when running barefoot on less stiff surfaces such as grass or cushioned mats.**

A. True
B. False

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**8. Which of the following is considered an intrinsic factor that influences strike type variation?**

A. Surface stiffness
B. Body mass
C. Heel cushioning
D. Running history

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**9. Existing injuries fall under which category of factors that influence strike type variation?**

A. Intrinsic
B. Extrinsic
C. Acquired
D. Existing injuries does not fall under any of the categories of factors that influence strike type variation

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**10. There was a significantly greater degree of foot strike angle variability within individuals who:**

A. Used higher step frequencies and who typically ran less.
B. Used higher step frequencies and who typically ran more.
C. Used lower step frequencies and who typically ran more.
D. Used lower step frequencies and who typically ran less.

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**11. Foot strike angle variation was affected by footwear history.**

A. True
B. False

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**12. Individuals who were barefoot had significantly less variable foot strike types than those who were wearing shoes.**

A. True

B. False

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**13. Habitually shod individuals were less likely to land with flat or plantar flexed feet.**

A. True
B. False

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**14. Individuals were less likely to rearfoot strike when they:**

A. Were experienced runners
B. Ran on a softer track
C. Preferred lower step frequencies
D. Were able to run slower

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**15. In general, all of the following describe the habitually barefoot participants, except for:**

A. They landed with more flexed knees and hips.
B. They had slightly more vertical trunks.
C. They preferred higher step frequencies.
D. They were more likely to overstride.

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**16. When a General Linear Mixed Model was used to tease apart which variables were associated with variations in foot strike angle, the strongest predictor was:**

A. Overstride
B. Ankle angle
C. Trunk angle
D. Knee and hip angle

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**17. Softer substrates, like cushioned heels, make rearfoot strike landings more comfortable by lowering the rate of loading of the impact peak.**

A. True
B. False

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**18. Which of the following is a disadvantage of rearfoot strike landings?**

A. They increase external moments around the knee.
B. They increase external moments acting around the ankle.
C. They require more calf and foot muscle strength.
D. All of the above are disadvantages of rearfoot strike landings.

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## 16 Weeks of Progressive Barefoot Running Training Changes Impact Force and Muscle Activation in Habitual Shod Runners

**19. In runners without experience in BF, impact forces seem to be increased during barefoot locomotion, suggesting increased risk of injuries compared to shod condition.**

A. True
B. False

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**20. Evidence shows that 4 - 12 weeks of simulated barefoot running induced:**

A. Reduced plantar pressure
B. Changes in muscle activation
C. A mid / forefoot strike pattern
D. Simulated barefoot running induced all of the above

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**21. Experienced BF runners presented with all of the following, except:**

A. Improvements in shock attenuation.
B. Larger incidence of first peak of vertical ground reaction force.
C. Reduced magnitude of impact peak of vertical ground reaction force.
D. Alterations in muscles activation pattern.

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**22. After training, similar, or even lower, impact force and muscle activation were observed for BF running compared to SH.**

A. True
B. False

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**23. Results show that BF running is characterized by more efficient shock attenuation than SH conditions in habitual shod runners.**

A. True
B. False

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**24. Recent studies have shown that injured runners present lower values of loading rate.**

A. True
B. False

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**25. Differences between BF and SH for root mean square before training were marked in muscles associated with shock absorption, such as all of the following, except:**

A. Tibialis anterior
B. Gastrocnemius lateralis
C. Vastus lateralis
D. Long head of biceps femoris

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**26. According to literature, greater muscle activation is related to injuries, high cost energy, and less efficient running economy. Therefore, habitual SH runners in their first attempt in this condition could have their protection and performance impaired.**

A. True
B. False

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**27. Both BF and SH running presented similar root mean square values after training for all muscles, except:**

A. Tibialis anterior
B. Gastrocnemius lateralis
C. Vastus lateralis
D. Long head of biceps femoris

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**28. BF running could be seen as a favorable training context to habitual BF runners, where they experience similar muscle activation of SH condition, but with decreased impact forces.**

A. True
B. False

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**29. Study results suggest that unshod training improves mechanical load control and shock attenuation in _____ running.**

A. BF
B. SH
C. Both BF and SH
D. Neither BF nor SH

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**30. According to the literature, reduced impact forces are related to switching from a midfoot / forefoot to a rearfoot strike pattern and to alterations in spatiotemporal parameters induced by BF conditions.**

A. True
B. False

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**31. Which of the following was the only muscle significantly influenced by training in SH running?**

A. Tibialis anterior

B. Gastrocnemius lateralis
C. Vastus lateralis
D. Long head of biceps femoris

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**32. Researchers report the kinematics and foot strike pattern induced by unshod running possibly improves the use of storage elastic energy.**

A. True
B. False

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## Comparison of Minimalist Footwear Strategies for Simulating Barefoot Running: A Randomized Crossover Study

**33. The reported kinematic and kinetic characteristics of barefoot running are more likely due to:**

A. A more plantar-flexed footstrike
B. The footwear conditions
C. Running speed
D. The running surface

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**34. All outcome measures of this study were significantly different between cushioned and uncushioned minimalist shoes, except:**

A. Step length
B. Stride frequency
C. Ankle angle
D. Knee angle

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**35. In this study, running shod led to increased _____ at footstrike compared to barefoot running.**

A. Step length
B. Stride frequency
C. Ankle angle
D. Knee angle

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**36. The lower ankle dorsiflexion angles in this study indicate a flatter foot at landing for barefoot and uncushioned shoe running.**

A. True
B. False

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**37. During barefoot and minimalist running, the _____ was still present in more than 50% of the participants.**

A. Forefoot strike
B. Midfoot strike
C. Rearfoot strike
D. Each strike pattern was present in equal proportions

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**38. The flatter foot placement at initial contact is a typical characteristic of barefoot running.**

A. True
B. False

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**39. This study showed a decrease of _____ when running barefoot.**

A. Step length
B. Stride frequency
C. Ankle angle
D. Knee angle

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**40. It has been previously shown that taking smaller steps:**

A. Reduces the impact force peak
B. Reduces the loading rates
C. May prevent impact-related injuries
D. Taking smaller steps reduces the impact force peak and loading rates and may prevent impact-related injuries

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## Footwear Decreases Gait Asymmetry during Running

**41. The absence of footwear has been identified as an important risk factor for the occurrence of falls in elderly adults.**

A. True
B. False

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**42. When increasing the sensitivity of the CAI, which of the following actions allows considering the moving human body as a whole system rather than analyzing individual variables?**

A. All available kinematic and kinetic data should be incorporated to provide an all-encompassing assessment of an individual’s lower limb gait asymmetry.
B. The waveforms of all gait variables should be normalized to their standard deviation waveform to account for asymmetry caused by the natural variability of the movement.

C. A principle component analysis can be used to filter out the covariate structure of gait asymmetry.
D. Gait asymmetry observed in one variable can only occur if it is accompanied by asymmetries in other variables.

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**43. Even in healthy, young adults, gait asymmetry is reduced when running barefoot compared to running in shoes.**

A. True
B. False

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**44. Investigating the relevant asymmetry variables and their correlations suggested that the _____ joint seems to be less important for the generation and compensation of gait asymmetry.**

A. Ankle
B. Knee
C. Hip
D. All leg joints are equally important for the generation and compensation of gait asymmetry

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**45. From a purely mechanical perspective, previous studies indicate that wearing footwear, which may not be manufactured perfectly symmetrical, may:**

A. Not affect gait asymmetry
B. Decrease gait asymmetry
C. Increase gait asymmetry
D. Gait asymmetry depends on intrinsic variables

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