

Correcting Foot Crossover While Running

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During running, foot crossover occurs as one foot steps in front of the other in the frontal plane. As a result, the stride width, or distance between right and left step lengths, is negligible. Narrow step width is associated with elevated mechanical stresses on the tibia and onset of tibial stress fractures (1,2). Moreover, narrow step width increases hip adduction, knee abduction moment, impulse (3), and ankle inversion injury (4). Therefore, minimizing crossover is a highly impactful strategy to help runners avoid lower-extremity stress fractures and potentially protect joints over the long term. There are two methods to determine if crossover is occurring: 1) while the individual runs on a treadmill, position oneself directly in front of the lower body and watch whether the feet appear to be running on a line, one in front of the other (the use of slow motion video on cell phones is an effective feedback tool

for replay); 2) if a treadmill is not available, ask the individual to run back and forth along a hallway or open area and watch in the frontal plane for feet placement one in front of the other. If confirmed, crossover can be eliminated with the following feedback cues. Examples of foot crossover and corrected gait are shown in Figures 1 and 2, respectively.

- “Imagine running with your left foot on the left side of a road line and your right foot on the right side of the line.”
- “Imagine the pedaling motion of cycling and keep your feet wide enough to pedal the bike.”
- Actively engage hip abductors (“squeeze the buttock muscles”).

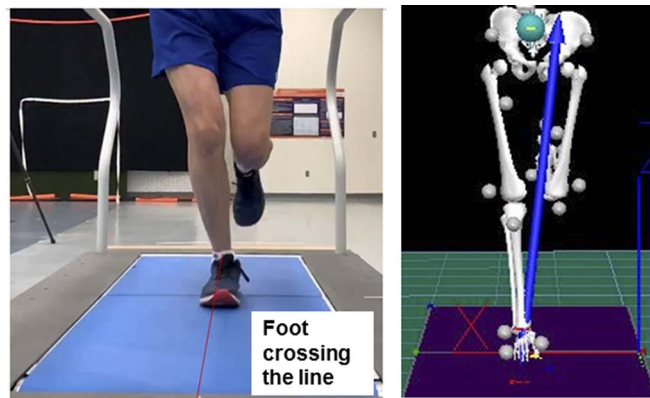


Figure 1: Foot crossover captured using cell phone video (left) and using motion analysis software (right); arrow is the direction of ground reaction forces that could lead to injury.

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- Decreasing stride length may aid in increasing step width (“take shorter, quicker, softer steps”) (5)

Thus, the use of simple cues is a practical, quick, and accessible method to help runners eliminate foot crossover and resultant harmful mechanical stresses on the lower body.

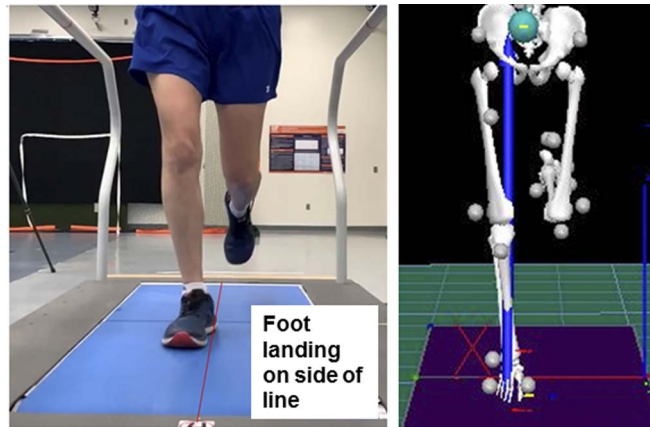


Figure 2: Elimination of foot crossover using cues.

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