

Upright Athlete Physical Therapy

3D Gait Analysis: EXAMPLE

Date:

Primary goal:

Upright Athlete Physical Therapy
admin@uprightathlete.com
919-943-1204
4221 Garrett Rd, Suite #1

SUMMARY OF FINDINGS:

CURRENT CONDITION(S):



PRINCIPAL FINDINGS:



PHYSICAL THERAPIST RECOMMENDATIONS

- Recommendation 1:
- Recommendation 2:
- Recommendation 3:

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OBJECTIVE MEASURES

The Movement Screen is a full body screen that looks at potential contributing factors to pain and movement inefficiency that may otherwise be overlooked. It was designed for you to easily assess your progress, and we advise that you check your functional movement weekly by checking your movement screen.

Next, the strength and stability assessment is looking at some of the most common areas that runners have weakness or poor control that may contribute to injury or decreased performance. You will be given specific exercise programs if you are unable to do any of the tasks in this assessment, and can self check your progress by your ability to complete these tasks.

Finally, the foot plays a large role in running performance and injury. This foot assessment looks at a combination of mobility and motor control elements needed in the foot for runners. Please see the Interpretation section in this report for details on how to address these findings.

UA Running Movement Screen

	Toe Touch	Back Bend	Rotation	Balance	Squat
SUCCESS					
SUB CATEGORY					

UA Running Strength/Stability

	UHBE	SL STS	SL Calf Raise	Hip ABD
SUCCESS				

UA Running Strength/Stability

	Toe Yoga	Hallux Ext	Hallux ABD	Ankle PROM
SUCCESS				

Specific measures

Name	Left	Right	Normative value

Notes:



DYNAMIC MEASURES

① RUNNING GAIT CHARACTERISTICS

[Speed: 5.7 mph] [Category: Collapser CPD]



Cadence: 183.10 spm

Cadence is the number of steps per minute you take. This has been linked to several running injuries including Anterior Knee pain and IT Band Syndrome. Cadence is measured in Steps Per Minute (spm)



Great job, your cadence is in the green category! There is no ideal cadence, but slower cadences have been linked to certain injuries. Keep it up!



Vertical oscillation: 7.68 cm

Vertical Oscillation is the amount of motion spent going up and down. This is calculated by the difference between your maximum and minimum height. A certain amount of vertical oscillation is necessary, but too high or low of values will place increased stress on the body.



Great job, your vertical oscillation is in the green category! Focusing your energy on running forward rather than up and down helps with injuries and performance. Keep it up!



Left Ground Contact Time:

196.67 msec

Right Ground Contact Time:

210.00 msec

Ground Contact time is the time spent with your foot on the ground in milliseconds.



Great job, your ground contact time is in the green category! Minimizing the time spent on the ground helps with decreasing injuries and improving performance. Keep it up!



Step and Stride Length Asymmetry Score: **0.42 % R increased**

Step length is the distance between the initial contact of one foot and the initial contact of the opposite foot. Stride length is the distance covered between initial contacts of the same foot. It is possible to have a longer stride length than double the step length because of flight time in running. Differences in step or stride length between sides may place you at risk of injury.

L	833.59	1669.15
R	837.13	1671.82

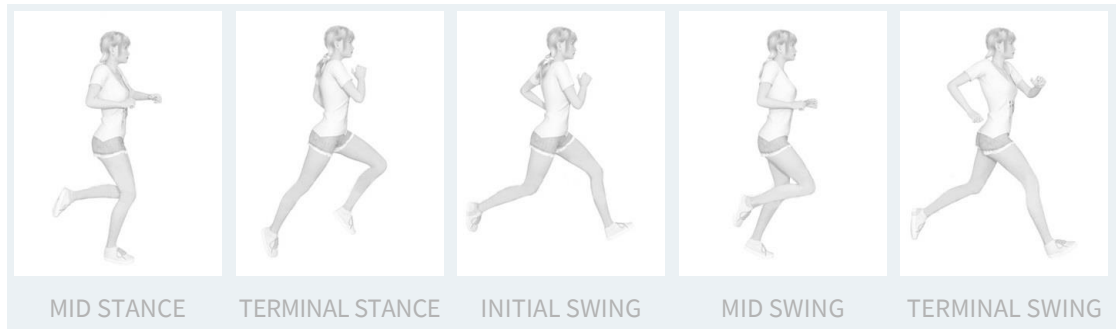
Notes if any:



1/4 INITIAL CONTACT PHASE



INITIAL CONTACT



MID STANCE

TERMINAL STANCE

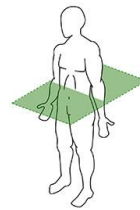
INITIAL SWING

MID SWING

TERMINAL SWING

i **Initial Contact (IC)** is the point at which your foot makes contact with the ground. Several factors during IC play a large roll in performance, efficiency, and injury. When we run, we interact with 3 planes of motion.

Events occurring in each of these three planes will have an affect on your performance as a runner.



TRANSVERSE

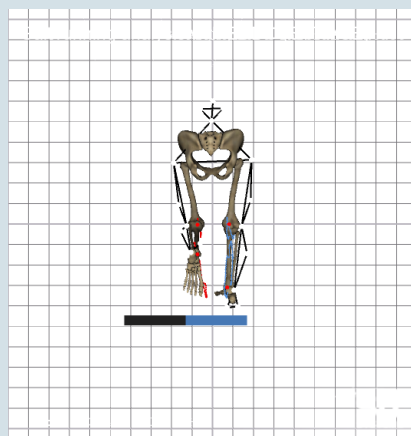


FRONTAL/CORONAL

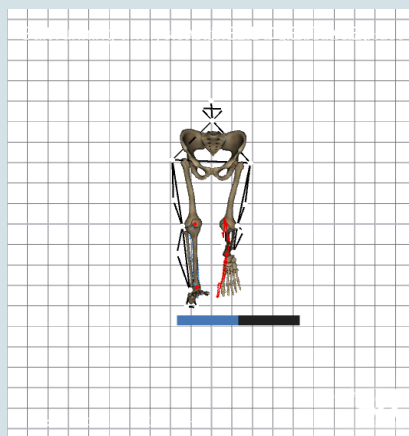


SAGITTAL

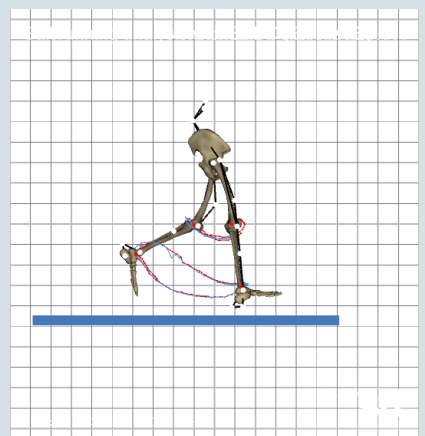
👁 Below you will find frontal plane and sagittal plane view of your running.



POSTERIOR VIEW

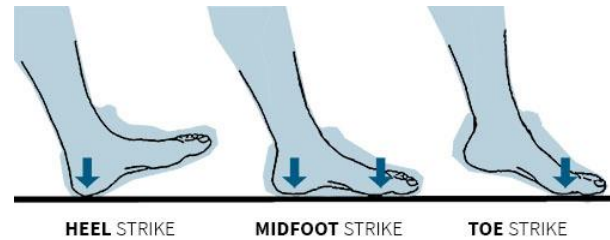


ANTERIOR VIEW



LATERAL VIEW

One of the most commonly looked at variables in running occurs during this IC phase is **strike pattern**. Strike pattern describes which part of your foot makes contact with the ground first. You have a **HEEL** foot strike pattern.

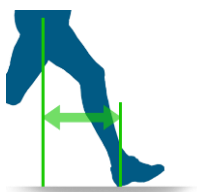


Not all heel striking is bad. The majority of people are heel strikers. This places more stress on the front of the leg, including the knee, and may increase forces throughout the body along with other gait characteristics. If your strike pattern does not match what you think, don't worry! In a study of recreational and collegiate runners, almost half of them were unable to self-identify their strike pattern.

Left Tibial Inclination: **vertical** Right Tibial Inclination: **extended**
Left Foot Inclination: **9.63° (DF)** Right Foot Inclination: **8.17° (DF)**



The angle of your foot (**Foot inclination**) and the angle of your shin bone (**Tibial inclination**) play a role in the forces that go through your legs. If your knee is almost fully straight when you land, it is not able to absorb forces as well. It is preferable to have a vertical or flexed position over an extended position.



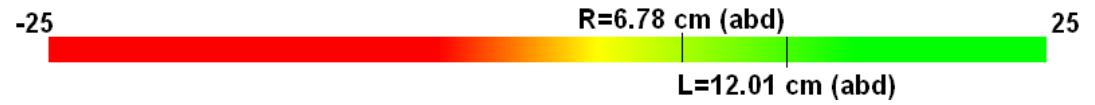
Left Strike from COM: **18 cm (fwd)** Right Strike from COM: **19 cm (fwd)**

The **distance from your Center of Mass (COM) to where your foot hits the ground** is a measure that is related to the forces going through your lower body. Ideally, the foot should land just ahead of the COM.

Left Crossover: **12.01 cm (abd)** Right Crossover: **6.78 cm (abd)**



Crossover:



Crossover describes the position of the foot at IC in relationship to the midline of your body. As we run faster, we naturally have a narrower stance. When the foot crosses over the midline excessively it can place stress on different structures in the body, most often the IT Band and knee. Your foot position is **normal** as pictured on the left.

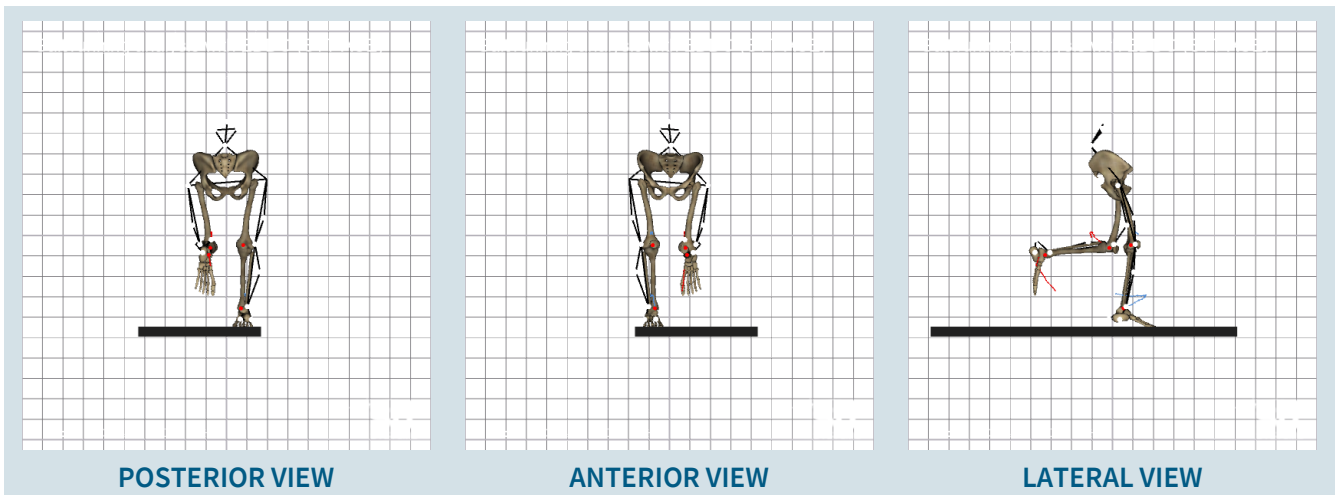


2/4 MID-STANCE PHASE



i **Mid Stance (MS)** is the second portion of gait that we look at, and is the point at which the foot is directly underneath of your hip. Most of the forces from striking the ground are absorbed between IC and MS. The goal during Mid stance is to avoid collapsing towards the ground excessively. Several factors during MS play a large roll in performance, efficiency, and injury.

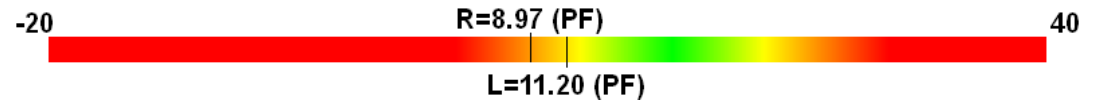
o Below you will find frontal plane and sagittal plane views of your running at **Mid Stance**.





Left Ankle Dorsiflexion: **11.2°**
(PF)

Right Ankle Dorsiflexion: **8.97°**
(PF)



Ankle Dorsiflexion measured at mid stance is a gauge of how much your body is sinking in to the ground. Too little is a sign of a stiff lower body while running that will not absorb shock well. Too much will often change where the stresses are absorbed. Normal value = 20°.



Left Foot Pronation: **3.66° (pron)**

Right Foot Pronation: **0.88° (pron)**



Ankle pronation is a normal part of running. When we pronate, it allows our foot to come in contact with the ground and absorb forces. Excessive motion or rapid motion places increased stress on the body, and is commonly seen in running injuries.



Left Peak Knee Flexion: **13.77°**
(flex)

Right Peak Knee Flexion: **17.99°**
(flex)



Peak Knee Flexion is another measure at mid stance that is a gauge of how much your body is sinking in to the ground. Just like dorsiflexion, too little is a sign of a stiff lower body while running that will not absorb shock well. Too much will often change where the stresses are absorbed.



Left Peak Hip ADD: **0.87° (abd)**
Left Peak Hip IR: **11.79° (int)**

Right Peak Hip ADD: **3.27° (abd)**
Right Peak Hip IR: **6.37° (int)**

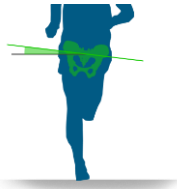




Rotation at the hip is another measure used to see how the body is doing with absorbing forces at mid stance. **Hip Adduction and Internal Rotation** are linked to several injuries including knee pain, shin splints, and IT Band pain. Normal value ADD = 15°. Normal value IR = 0-5°

Left Contralateral Pelvic Drop:
1.28° (rgt up)

Right Contralateral Pelvic Drop:
2.46° (rgt up)



Contralateral Pelvic Drop is often seen in association with excessive hip, knee and ankle collapse. It is often debated whether this excessive collapse is generated from the bottom down (i.e. the hip drop causes changes in the joints below) or from the bottom up (i.e. a lower joint weakness causes changes in the joints above).

Left Forward Lean Angle: **flexed**

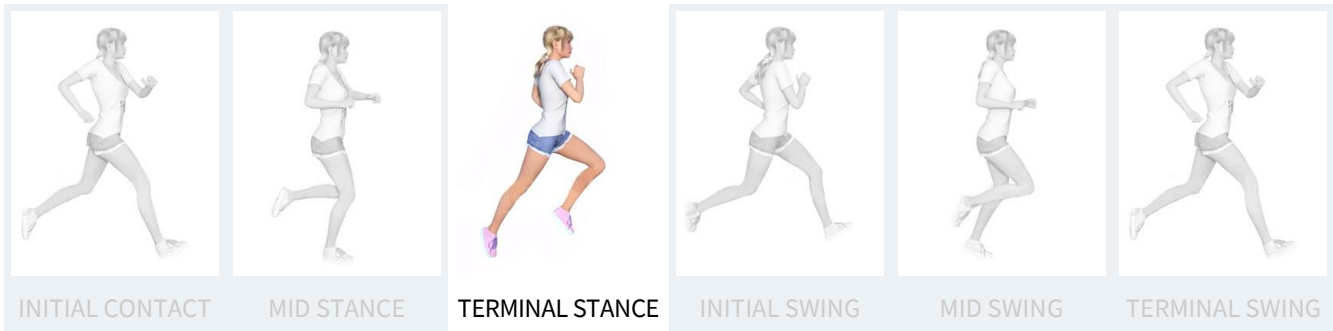
Right Forward Lean Angle: **flexed**



Forward Lean Angle measures how far forward or backwards you lean during running. This position can have an effect on which muscles are doing more work and the amount of work that they have to do. A backwards trunk lean is often seen in people with poor gluteal strength. Your lean angle is 8°, which falls into a normal.

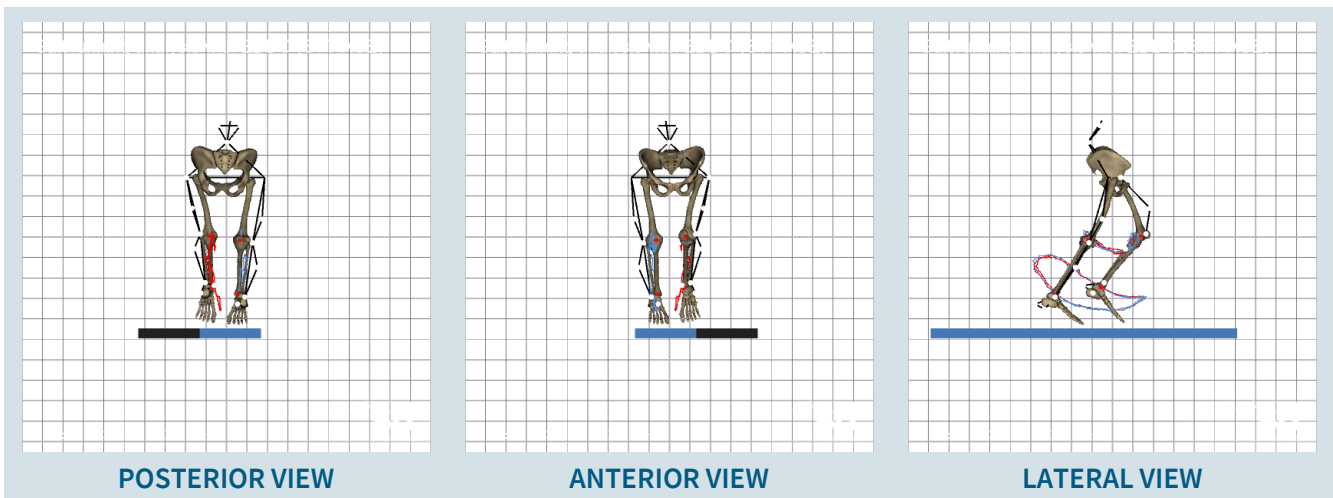


3/4 TERMINAL STANCE PHASE

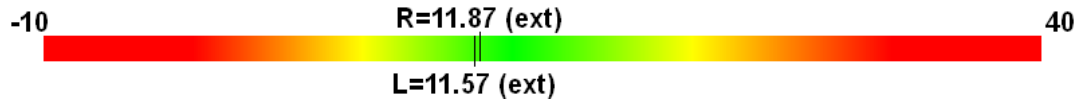


i **Terminal Stance (TS)** is the third portion of gait that we look at, and is the final point at which the foot is still in contact with the ground. The goal for this phase has switched from force absorption during MS to force creation. Several factors during MS play a large roll in performance, efficiency, and injury.

o Below you will find frontal plane and sagittal plane views of your running at **Terminal Stance**.



Left Hip Extension: **11.57° (ext)** Right Hip Extension: **11.87° (ext)**



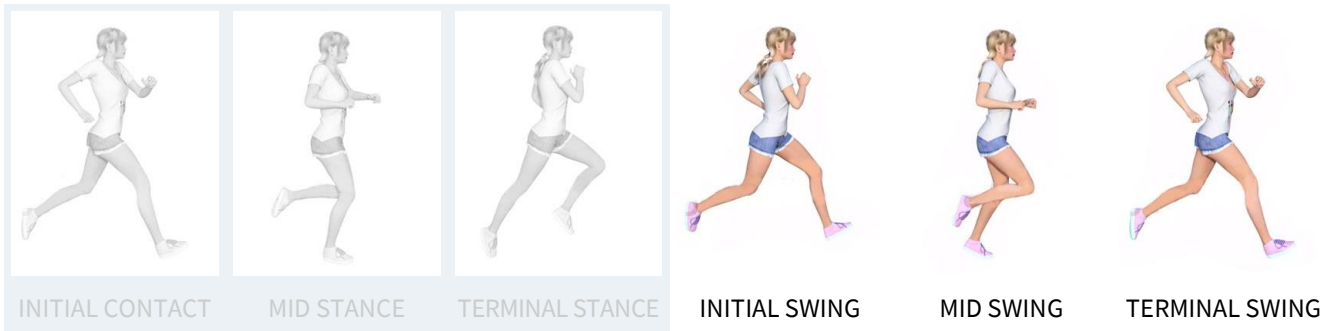
Runners with tight hip flexors will often have limitations in **Hip Extension** measured at terminal stance. Too little hip extension can place excessive strain on structures including the lower back. Normal ranges HE = 10-20°.

Left Ankle Supination: **5.46° (sup)** Right Ankle Supination: **5.1° (sup)**



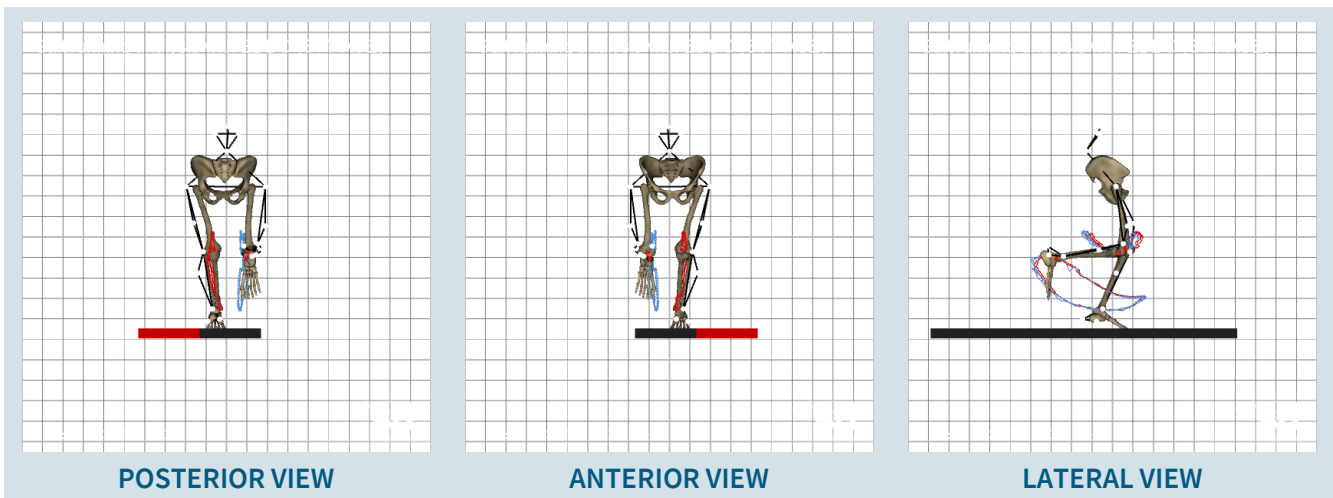
Ankle Supination is required at terminal stance to provide a rigid foot to push off of to propel forward. The degree of supination and the rate of supination can be related to certain injuries.

 4/4 SWING PHASE



i We look at **Swing Phase** to see how the leg is being positioned to make contact with the ground. Alignment during swing phase can set up what happens when the foot is on the ground. Several factors during Swing Phase play a large roll in performance, efficiency, and injury.

o Below you will find frontal plane and sagittal plane views of your running at **Mid Swing**.



Left Hip flexion: **12.31° (flex)**

Right Hip flexion: **14.83° (flex)**



Hip flexion at mid swing has been linked to the rate at which the foot accelerates towards the ground at IC. If you are limited in hip flexion, it may change how you absorb forces on the ground. Normal range HF = 10-20°.