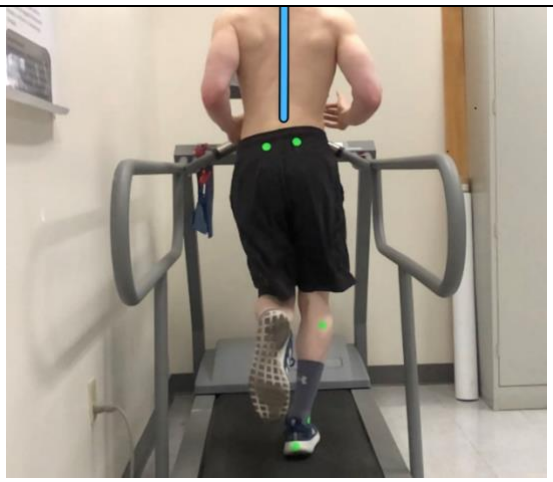
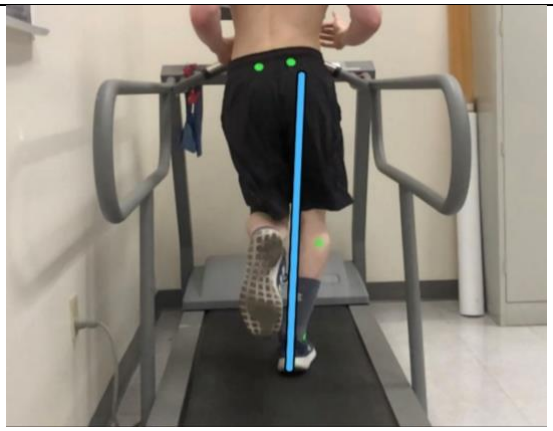
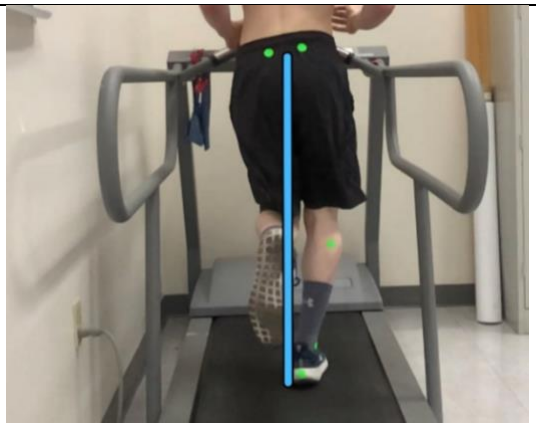
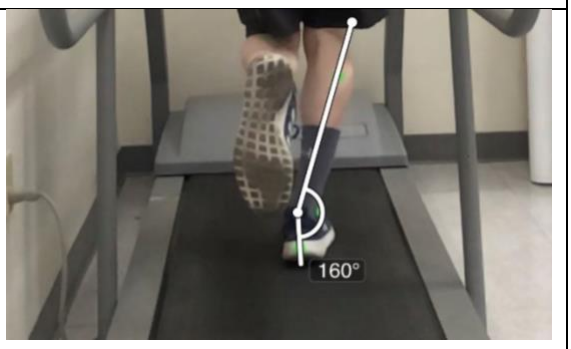
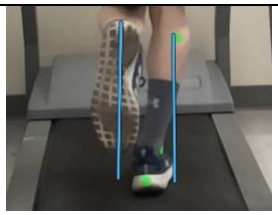
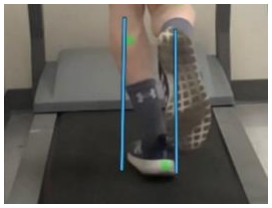
Appendix 1: Running Gait Checklist

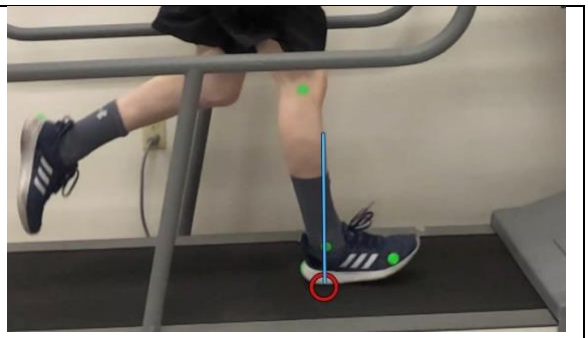
Frontal Plane: Measurements at midstance

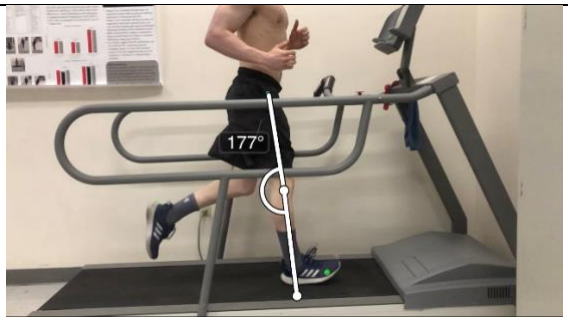
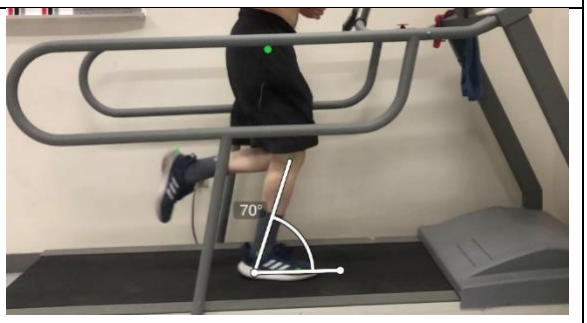
Trunk sidebend **Description** Line from T1-S1 relative to true vertical **Clinical significance** -*Increased trunk motion (either direction)*: low back pain -*Ipsilateral sidebend*: attempt to unload lateral hip of stance limb	**Scoring** Stance limb reference -Excessive ipsilateral -Mild ipsilateral -Appropriate (vertical) -Mild contralateral -Excessive contralateral	 Example of *appropriate* trunk sidebend
Lateral pelvic drop **Description** Line through PSISs relative to true horizontal **Clinical significance** -*Increased contralateral pelvic drop*: IT band syndrome, anterior knee pain, lateral hip pain on stance limb	**Scoring** Stance limb reference -Appropriate (male: 3-5 degrees; female: 4-7 degrees) -Mild contralateral -Excessive contralateral	 Example of *mild contralateral* lateral pelvic drop
Knee center position **Description** Position of knee center relative to line connecting hip and ankle centers **Clinical significance** -Medial/lateral position of knee: patellofemoral pain	**Scoring** Stance limb reference -Excessive lateral -Mild lateral -Appropriate (mid-line) -Mild medial -Excessive medial	 Example of *excessive lateral* knee center position

Knee separation **Description** Distance between medial aspect of knees **Clinical significance** -Narrow knee distance: dynamic valgus -Wide knee distance: dynamic varus -Both related to anterior knee and hip pain	**Scoring** -Excessive narrow -Mild narrow -Appropriate (slight separation) -Mild wide -Excessive wide	 Example of *mild narrow* knee separation
Foot-to-COM position **Description** Mediolateral distance of the medial heel to a vertical line from the center of the sacrum **Clinical significance** -Crossover: medial tibial stress syndrome, IT band syndrome	**Scoring** Stance limb reference -Excessive crossover -Mild crossover -Appropriate (medial shoe adjacent to line) -Mild wide -Excessive wide	 Example of *appropriate* foot-to-COM position
Rear foot position **Description** Midline of rearfoot relative to midline of the lower leg **Clinical significance** -Increased pronation: anterior knee pain, Achilles tendinopathy, medial tibial stress syndrome, peroneal tendinopathy -Increased supination: bone stress injuries	**Scoring** -Excessive pronation -Mild pronation -Appropriate -Mild supination -Excessive supination	 Example of rear foot *mild pronation*

Forefoot position **Description** Position of forefoot relative to heel **Clinical significance** -Increased abduction: Achilles tendinopathy, plantar fasciopathy -Increased adduction: bone stress fractures	**Scoring** -Excessive abduction -Mild abduction -Appropriate -Mild adduction -Excessive adduction	 Example of forefoot *mild abduction*
Heel-height symmetry **Description** Highest point of heel during swing phase **Clinical significance** -Asymmetrical heel height: unequal power generation from lower extremities	**Scoring** -Left heel low -Appropriate (symmetrical) -Right heel low	  Example of *right heel low*

Sagittal Plane: All measurements are done at initial contact, except knee flexion angle and ankle dorsiflexion at midstance

Foot strike pattern **Description** Part of foot that contacts running surface first **Clinical significance** -Heel strike: anterior knee pain, lower-leg injury	**Scoring** -Heel strike -Rearfoot strike -Midfoot strike -Forefoot strike	 Example of rear foot strike pattern

Tibial inclination **Description** midline of the lower leg relative to true vertical. **Clinical significance** -Increased inclination: bone stress injures of the lower leg	**Scoring** -Appropriate (within 5 degrees of vertical) -Mild inclination -Excessive inclination	 Example of tibial *mild inclination*
Knee flexion angle (*Initial contact)* **Description** Midline of thigh relative to midline of lower leg **Clinical significance** -Decreased knee flexion: over-striding, anterior knee pain, lateral hip pain	**Scoring** -Excessive decrease -Mild decrease -Appropriate (about 20 degrees knee flexion) -Mild increase -Excessive increase	 Example of *excessive decrease* knee flexion angle
Knee flexion angle (*midstance*) **Description** Midline of thigh relative to midline of lower leg **Clinical significance** -Increased knee flexion: increased patellofemoral joint load, anterior knee pain	**Scoring** -Excessive decrease -Mild decrease -Appropriate (about 40 degrees of knee flexion) -Mild increase -Excessive increase	 Example of *mild decrease* knee flexion angle
Ankle dorsiflexion angle **Description** Midline of lower leg relative to sole of foot **Clinical significance** -Increased inclination: Achilles tendinopathy	**Scoring** -Appropriate (20 degrees dorsiflexion) -Mild inclination -Excessive inclination	 Example of *appropriate* ankle dorsiflexion angle

Initial contact: First contact of the shoe to the treadmill belt; *Midstance*: Instance when the swing knee is adjacent to the stance knee.