Sample Biomechanical Report
To identify the root cause of an injury, and thus determine the optimal treatment for that injury, many pieces of your injury “puzzle” must be considered. At the Running Injury Clinic, we take into consideration four main puzzle pieces as shown below. Scientific measures of many variables are collected and compared to our ever-growing normative database. All of your individual measures, how they compare to our normative database, and explanations of each measure can be found within the report. If, after having this report explained to you by a trained health professional, you have any question, do not hesitate to contact us.

Our primary goal is for everyone to experience the joy of running. Your health and well-being is important to us and we are committed to helping you resolve your injury and prevent future injuries.
Your percentile rank for each of the “puzzle” pieces is shown below. You want your “puzzle piece” score to be closer to 100% when compared to our normative database. Thus, you want your “Risk” score to be closer to 0% and a lower injury risk potential. **Our goal is to reduce your Injury Risk Score by identifying atypical biomechanical gait patterns.**

For the following graphs, the blue dot is your left limb and the red dot is your right. The ranges of “too much motion,” “ideal motion,” and “too little motion” are based on our normative database. These data are meant to be a guide for your treating clinician to help their decision-making process regarding gait symmetry, injury assessment, and injury progress.
Appendix and Summary of Terms (abbreviated list)

**Foot Pronation:** How much your foot collapses inward when running. Pronation is necessary to accommodate to uneven surfaces, dissipate impact forces, and allow your big toe to reach the ground. Excessive foot pronation can cause the lower leg to rotate too far inward, which may increase twisting forces at the knee. Common clinical reasons for excessive pronation are weakness in the ankle invertor muscles (tibialis posterior), excessive rearfoot range of motion, a flexible arch, or excessive knee or hip collapse due to weak hip stabilizer muscles which can induce or drive the foot inwards.

**Time to Peak Pronation:** How quickly your foot pronates and it should occur around 50% of stance. The foot needs to complete pronation and begin to supinate (lock-up) in order to have an efficient push-off and maintain joint alignment. If the foot stays pronated for too long a period of time, or pronates too quickly, twisting forces at the ankle and knee joint can occur. Common clinical reasons for prolonged pronation include weakness in the ankle invertor muscles (tibialis posterior) or excessive knee or hip collapse due to weak hip stabilizer muscles which can induce or drive the foot inwards for too long.

**Heel Whip:** During gait, the hip and knee internally rotate throughout stance creating torsional or twisting forces within these joints as well as the ankle joint. Once the foot comes off of the ground the leg can rotate outward much like a spring that is allowed to unwind. However, with insufficient flexibility or strength, a “whip” is measured, indicating increased twisting forces within the ankle, knee and hip and that the spring was wound too tight during each step. Common clinical reasons for a heel whip include reduced hip rotator muscle flexibility, reduced hip rotator muscle strength, or increased tibial torsion.

**Pelvic Drop:** With each step during gait, you spend time standing on one leg. This is called “single support”. During single support, the pelvis usually drops slightly on the opposite side. The hip abductor muscles on the standing leg, as well as your core stabilizer muscles, function to keep the pelvis level and prevent too much of a drop. Excessive pelvic drop, therefore, may indicate weakness in the hip stabilizing or core muscles. Commonly, excessive pelvic drop is usually associated with excessive hip and knee collapse.

**Hip Collapse:** During gait, the hip collapses inwards and this action is controlled by the hip stabilizing muscles. However, with insufficient strength, a greater than normal amount of inward collapse is measured, which can contribute to increased forces within the pelvis, hip, and knee joints and can even cause the foot to excessively pronate or pronate too long. Common clinical reasons for hip collapse include weak hip stabilizer muscles and it is usually associated with excessive knee collapse and pelvic drop. Increased hip collapse can also create and induced (excessive) foot pronation position.