INTERPRETATION SUMMARY

This document summarises the key observations and recommendations that were discussed with you during your assessment.

Client Name:	Emma Neachelle
Event and Assessment Date:	National Running Show 2020 (25 - 26 January 2020)
Report Written By:	Dr. Jessica Leitch and Andrea Ross (Physiotherapist)

KEY OBSERVATIONS

Power Plane (Sagittal)	• Pelvic tilt, hip flexion at foot-strike and hip extension at toe-off are all within the control range bilaterally. • Knee flexion at foot-strike is within the control rang bilaterally. • Dorsiflexion at foot-strike is good bilaterally. This indicates runner is a rear-foot striker bilaterally. • Plantarflexion at toe-off is within the control range bilaterally. • Both peak knee flexion and peak dorsiflexion are reduced bilaterally (L-, R-).
Control Planes (Transverse & Frontal plane)	• Frontal Plane: Pelvic obliquity is reduced on the left and within the control range on the right (L-). Hip adduction is excessive on the left and notably excessive on the right (L+, R++). Knee abduction is reduced on the left and notably reduced on the right (L-, R--). • Transverse Plane: Pelvic rotation at foot-strike is good. Hip rotation is reduced on the left and within the control range on the right (L-). Knee internal rotation is within the control range on the left and excessive on the right (R+).
Rear-foot and Ankle	• Peak eversion is within the control range on the left, reduced on the right, and asymmetric (R-). • Inversion at foot-strike is within the control range bilaterally but asymmetric (R>L). • Eversion excursion is good. • Tibial rotation peak is reduced on the left, within the control range on the right, and asymmetric (L-). • Medial heel whip is good. • Foot progression angle is excessive bilaterally (L+, R+).
Spatial-Temporal	• Cadence is 161, below our control data (173).

	• Vertical excursion is good. • Over-stride is within the control range on the left and excessive on the right (R+) and step-width is within the control range.

OPINION

Overall a good report as most of the key observations noted above are linked and can be addressed as follows:

- Sagittal plane motion is overall good. As you increase your speed ensure you focus on extending with your hip as opposed to pushing through your ankles as this is more efficient for power production over longer distances.
- The low knee flexion at foot-strike indicates that you are landing with a very hard/locked/straight knee. This increases the impact at foot-strike and reduces shock absorption, leading to increased loading of the lower-extremity. Gait retraining to 'soften' your knee at foot-strike would certainly be of benefit. Increasing your cadence (max. 10% at a time) will have a similar outcome and might be easier for you to achieve.
- The results indicate a lack of ankle dorsiflexion leading to reduced peak knee flexion. Gastrocnemius and soleus stretching will be included in your rehabilitation programme.
- There is general instability and reduced control in the frontal plane with high hip adduction bilaterally, which is a risk factor for many running related overuse injuries. Your rehabilitation programme will include hip abductor strengthening and gait re-education cues to try and improve this.
- The results indicate that you are landing with a rear-foot strike running pattern. The low cadence and over-extended knee at foot-strike (on the right) are consistent with this biomechanical profile. Gait retraining to 'soften' your knee at foot-strike/increase your cadence/land with your foot closer to your centre of mass will certainly be of benefit.

RECOMMENDATIONS (See attached rehabilitation programme for specific exercises)

Based on your Run3D results, your rehabilitation programme (attached) focuses on the following:

STRENGTH:

- Hip abductor strengthening

FLEXIBILITY:

- Gastrocnemius and soleus stretching

GAIT RETRAINING:

Focus one of the following cues, whichever is easiest for you to deliver. The outcomes will be similar. Try building-up the time you do this during a run from 5-minutes until it becomes a natural and learned behaviour. There is an extensive body of evidence to show that gait re-education is an effective and long-term solution to improving gait mechanics.

- Concentrate on landing with softer/more bent knees to reduce impact and braking forces. Landing with your feet closer to your body has a similar result. Increasing your cadence will also help address the hard knee problem and reduces impact at foot-strike.
- Increase your cadence by practicing quicker/faster steps. You can do this first by running on the spot, or try it during small sections of your run (ex. 1 min practice every 5 minutes). It may feel like harder work to begin with but over time improves your efficiency as well as your ability to load through your joints - therefore reducing injury risk.
- Keep your knees pointing forwards as you run.

FOOTWEAR:

- Eversion max and eversion excursion are in the low/ normal range. This suggests your current shoe has adequate control for your current running style.

OTHER:

The summary results of your report are commenting on shoe 1 (not your pink trainers) as these were seen to have better results. We recommend that you use these shoes instead of the pink trainers for your current running style.

Please do not hesitate to contact me if you have any questions about the information presented here.

With best wishes,

Dr. Jessica Leitch