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**Who:** 11-year-old female soccer player with c/o B anterior knee pain and heel pain

**What:** Return to running/Progressive loading program was introduced with the AlterG Anti-Gravity Treadmill to help this patient return to competitive soccer without limitations and without pain

**Why:** Body weight support allows patients to work on running mechanics in a controlled setting to minimize pain, which encourages consistency and compliance.

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## Introduction

An 11-year old female soccer player presents to the clinic with complaints of bilateral anterior knee pain and heel pain. She reports that her pain level goes as high as 4/10, on visual analog scale, with playing soccer, negotiating stairs, and running. The patient had not undergone any diagnostic tests. Physical therapy evaluation revealed weakness in gluteus medius, quadriceps, and calf muscles. She also had poor double and single leg squatting mechanics (increased hip internal rotation and knee valgus) and running form. Her lower extremity functional scale score was 84% (higher is better).

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## Goals

- Normalize running mechanics.
- Be able to run a mile without any symptoms.
- Return to competitive soccer without any limitations or any symptoms.
- Increase lower extremity muscle strength as needed for patient's function.
- Be able to demonstrate good squatting mechanics.
- Be independent with her home exercise program to avoid future recurrences

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## History

• The patient was seen for a total of 13 visits. Treatment consisted of running instruction on AlterG, soft tissue mobilization techniques, strengthening exercises, neuro-muscular reeducation, body mechanics instruction, balance training, flexibility exercises, and home exercise instruction.

• Running in AlterG was initiated at the 5th visit at 50% body weight. Patient reported no pain

during and after running in AlterG.

• Between the 5th and the 6th visit, the patient had an unrelated trampoline related injury which aggravated her Right Achilles tendon. Hence on the 6th visit, we did not have her perform any running or impact activity. Instead that session, we focused on reducing her pain and inflammation, which helped to restore her ability to resume

The patient is a Physical Therapy Assistant in a

# AlterG Case Study

hospital and is on her feet 8 hours a day. She helps to mobilize people out of bed and was running again at the next visit. On the 7th visit, AlterG was resumed at 60% body weight. Patient reported no knee or heel pain during and after running in the AlterG.

- 8th visit onwards, the patient displayed improved ability to run in AlterG at gradually increasing body weight percentage. When the patient was in the AlterG, specific emphasis was placed on her running cadence. She was also cued to correct for over-striding. Patient reported feeling safe while correcting her running form as the machine supported her well and she did not have to worry about falling off the AlterG.

- By the 13th visit, the patient was able to run, without any symptoms, at 80% of her body weight and at speeds as high as 9 mph.

- Outside of her rehabilitation, the patient reported gradual improvement in her tolerance to running and playing Soccer.

## Progression Table

Day or Week	Program (% Body Weight and Speed)	Incline (%)	Time	Frequency
Visit 5:	50% at 5.5 mph	2%	8 min.	1 x daily
Visit 7:	60% at 6 mph	2%	8 min.	1 x daily
Visit 8:	65% at 2.0-5.0 mph	2%	18 min.	1 x daily
Visit 9:	70% at 2.0-5.5 mph	2%	18 min.	1 x daily
Visits 10-11	70%-80% at 2.0-5.5 mph	2%	18 min.	2x daily
Visits 12-13	80% at 2.0-9.0 mph	2%	12 min.	2 x daily

## Results

At the initial evaluation, patient reported her pain to be at 4/10, on visual analog scale, in her knees and heels. AlterG was introduced early in her rehabilitation process. As the patient underwent rehabilitation, her pain gradually decreased to 0/10. She was seen on a 1/week basis until the 9th visit and then 2/week for 2 more weeks. During the rehabilitation, we were able to gradually increase the body weight percentage, on AlterG, from 50% to 80%. The patient retained her running mechanics, while running on a regular treadmill at full body weight. Additionally, she demonstrated improved double leg squatting mechanics. Her lower extremity functional scale score increased to 95%. Throughout the rehabilitation, patient self-reported a

decent compliance to her home exercise program.

In parallel, the patient reported improved tolerance to running and playing soccer, when she was out of the clinic. The patient reported that she was able to successfully transfer the proper running technique learned on the AlterG, to running outdoors. The patient's personal goals to return to competitive soccer without limitations and without pain were met. She was extremely pleased with her outcome.