Anti-Gravity Treadmill Walking Improves Gait Metrics and Joint Pain in Individuals with Knee Osteoarthritis

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INTRODUCTION

- Lower Body Positive Pressure (LBPP, anti-gravity) treadmill walking is commonly prescribed to individuals with lower extremity injuries as a method of off-loading the joint and reducing pain.
- This study explores how the treadmill affects joint function in participants with Kknee osteoarthritis (OA).

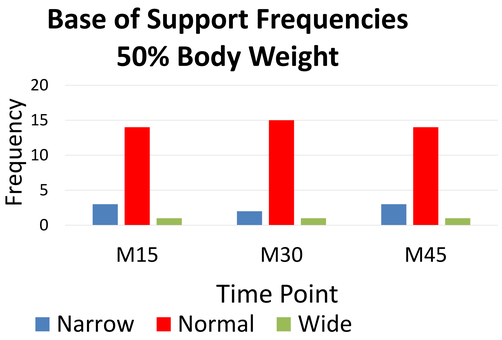
OBJECTIVE

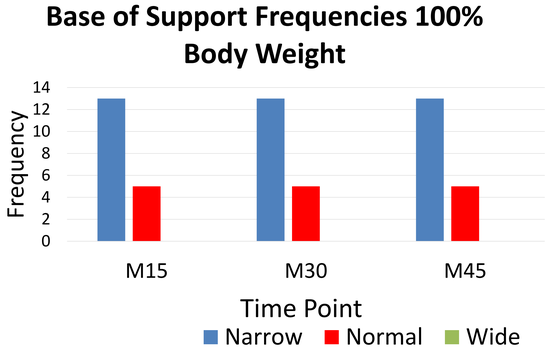
- **Investigate the impact of joint off-loading while walking affects gait metrics and joint pain**

METHODS

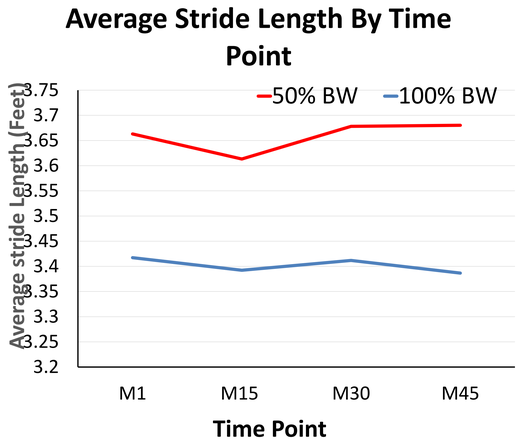
- 20 participants with diagnosed Knee Osteoarthritis
  - Mean age 64.4
- Each underwent two 45-minute walking trials at least 72 hours apart:
  - One with 50% of body weight supported by the treadmill.
  - One with no body weight supported by the treadmill.
- Every 15 minutes during each trial:
  - Pain score was measured using a Numeric Pain Rating Scale.
  - Frontal plane kinematics and gait metrics were measured, including:
    - Cadence (steps/minute)
    - Stride length (feet)
    - Base of support (wide vs narrow vs normal)

RESULTS

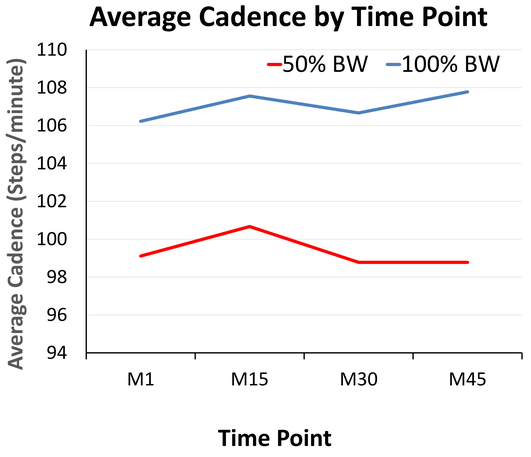




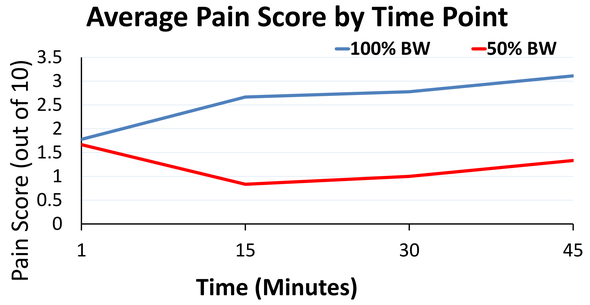
McNemar Chi Sq=6.231, p=0.013



Mean difference between trials:
0.518 feet, t=2.284, p=0.008



Mean difference between trials:
9.00 steps/minute, t=4.079, p<0.001



DISCUSSION

- The results indicate that LBPP walking has significant effects on pain and gait metrics in patients with Knee OA.
- These improvements contribute to the treadmill's utility as a rehabilitation tool.
- Future studies should explore the effects on knee flexion/extension angle and varus/valgus angle/

CONCLUSIONS

- **Off-loaded LBPP walking significantly improves certain gait parameters and joint pain in individuals with Knee OA.**
- **Further study is needed to correlate these findings with long-term clinical outcomes/**
- **This study is part of a project studying biomarkers of cartilage breakdown during LBPP walking. Further study is needed to explore correlations between gait metrics and those biomarkers.**

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