INTRODUCTION

- Females experience physiological changes which may lead to lumbopelvic pain, challenges with functional mobility, and/or postural stability deficits.
- Healthy pregnant women exhibit gait adjustments [1,2] and report falls during pregnancy, with over 1/3 of reported falls occurring on stairs [3].
- Pregnant women with lumbopelvic pain report mobility challenges with sit-to-stand and stair negotiation [1,4,5].
- Clinicians are challenged to quantify the performance of mobility tasks throughout the continuum of pregnancy.

PURPOSE

- To evaluate capabilities of APDM monitoring system & GAITRite instrumented walkway in capturing functional performance during a condition of simulated pregnancy.

METHODS

- Participants: 8 healthy females (23 ± 1 yr) participated.
- Protocol:
  - Donned 6 APDM mobility monitors (Figure 1).
  - Walked 2x 25 feet at comfortable pace, including 14-feet over GAITRite instrumented walkway (Figure 2).
  - Performed 5 trials in normal condition and five trials in simulated pregnancy condition by wearing 13-kg pregnancy vest (Figure 3).
- Analysis:
  - GAITRite data processed via ProtoKinetics software (PKMAS).
  - APDM data processed via Mobility Lab software.
  - Five trials per participant averaged by condition.
  - Paired t-tests (in Excel) compared conditions and measurement systems.

RESULTS

- No differences were noted between conditions in gait speed (Figure 4) or cadence (Figure 5) with either system (P>0.05).
- A trend towards higher velocity and higher cadence in the simulated pregnancy condition was noted with the APDM system compared to the GAITRite/PKMAS assessments (P=0.06). The APDM-measured cadence during simulated pregnancy suggested an increase compared to the normal condition (P=0.06, Figure 5).
- A difference was identified in step length between the normal and simulated pregnancy conditions when assessed with the GAITRite/PKMAS methodology (P=0.002, Figure 6).
- No differences were noted in step length with the APDM system when converted to length (cm), although measures were identified as being different as a percent of normative height as calculated in the Mobility Lab software (P=0.003).

DISCUSSION

- Both movement assessment systems appear consistent in measurement of temporospatial gait parameters in a healthy condition.
- The APDM system may provide an enhanced assessment as it measures over a greater number of strides compared to the GAITRite in the current environment (25 ft vs. 14 ft).
- Based on pilot work, additional evaluation is needed prior to APDM use for functional mobility assessments in a pregnant population.
- Validation with motion analysis will be necessary for gold standard comparison of movement parameters for stair negotiation as PKMAS does not assess this movement.

REFERENCES