

**Proximal kinematic consequences  
of addressing equinus with  
Functional Electrical Stimulation  
(FES)**

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Case studies to investigate quantification of proximal kinematic improvements as a consequence of reduction of floor-clearance compensation mechanisms.

- Proximal movement in gait is too complex for the human eye to process and evaluate.
- Consider coronal and transverse plane in these case studies.
- Numerous reasons for adopting compensatory mechanisms.

**Subject 1**

- 53 year old gentleman
- CVA 2007
- Left foot drop/inversion
- (R) sided back pain
- 1 fall every 3 months/catches foot at every walk
- Mob with 1 stick

**Intervention**

- Single channel FES for (L) footdrop
- Correction of DF and inversion
- More walking outside
- More upright posture / reduced back pain

**Video subject 1/14**

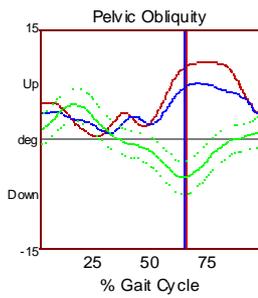


Figure 1. Coronal plane pelvic plots for patient 1 with FES (blue line) and without FES (red line).

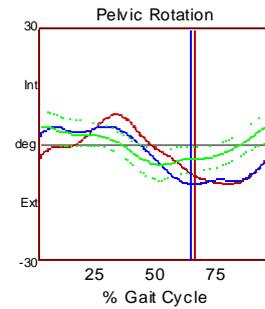


Figure 2. Transverse plane pelvic plots for subject 1 with FES (blue line) and without FES (red line).

## Subject 2

- 50 year old lady
- MS
- (R) foot drop
- Falls every 2 weeks
- Trips every week
- Fatigue
- Reduced balance in walking

## Intervention

- Single channel (R) FES to correct foot drop
- Increased confidence
- Walks dog / socialises more
- Less fatigue and effort
- Increased speed

## Video subject 2 /19

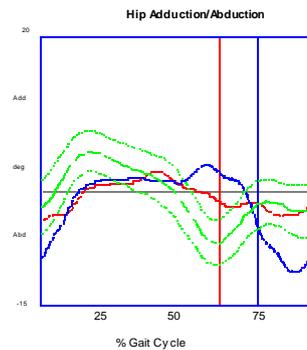


Figure 2. Coronal plane hip plots for subject 2 with FES (red line) and without FES (blue line).

## Discussion

- Distal FES directly reduces compensations
- Improves foot placement and action so improving proximal activity and alignment still further.

## Discussion

- Aesthetics
- Low back pain / Hip pain / knee pain (ipsilateral and/or contralateral)
- Shoulder/neck/thoracic pain
- Less pressure on walking aids/ through ULs
- Fatigue / effort
  
- Further work is proposed to quantify this further.

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