



Neurogym Technologies

St. Patrick's Home – Ottawa Ontario

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Participants

- 11 residents of St. Patrick's LTC facility – selected by restorative care staff based on the following criteria:
 1. Able to transfer with supervision or assistance from 1 person
 2. Able to understand and follow instructions
- At the start of the training program each of the residents requires some assistance to perform 5 consecutive sit to stand movements
- Most common co-morbidities included Parkinson's disease, multiple sclerosis, osteoarthritis, dementia



Methodology

- 92 day case study
- Training sessions 3x / week for 25-30 minutes
- Assisted standing with the NeuroGym sit to stand trainer
 - Up to 50 repetitions in a session
 - Progressive reductions in weight assistance
- Games-based biofeedback training
 - Began at week 5
 - Progressive increase in game speed



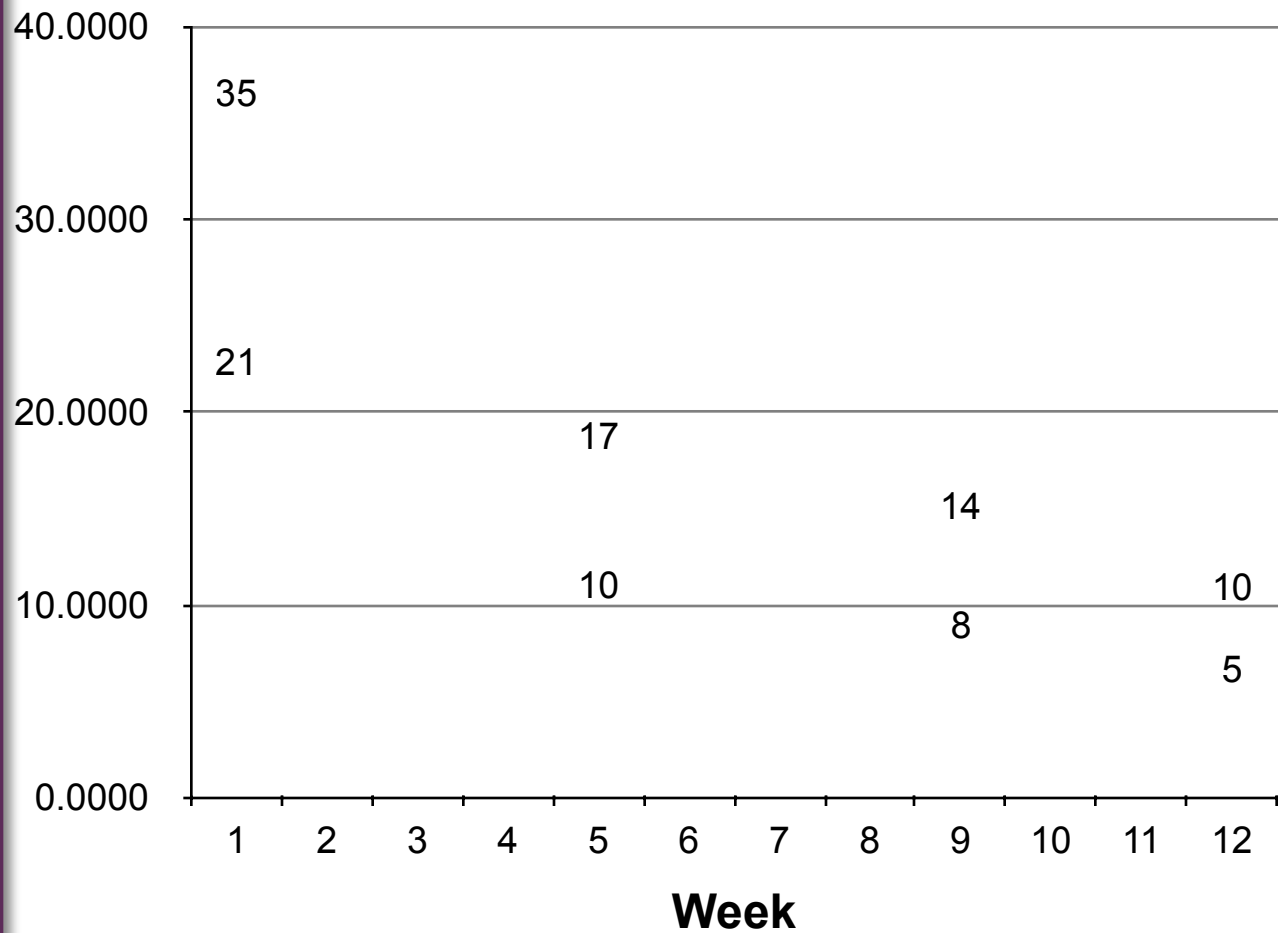
Sit To Stand Trainer



NOT A LIFT!



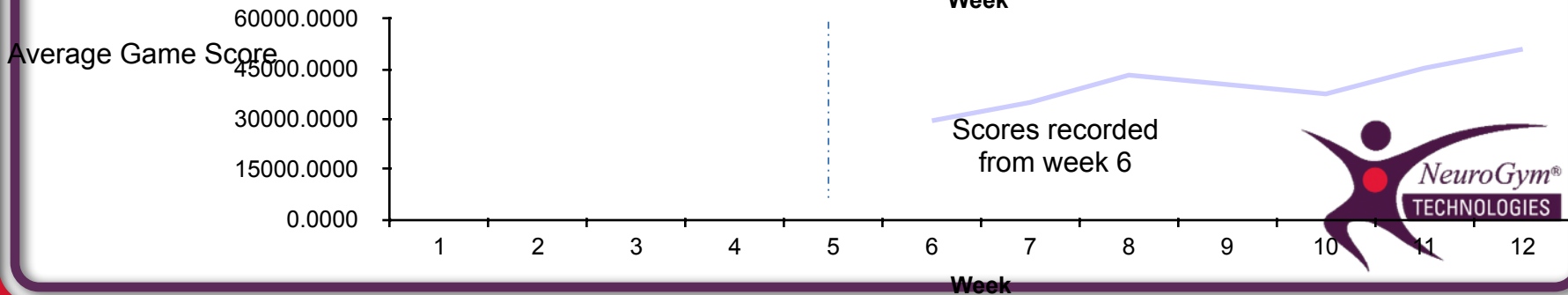
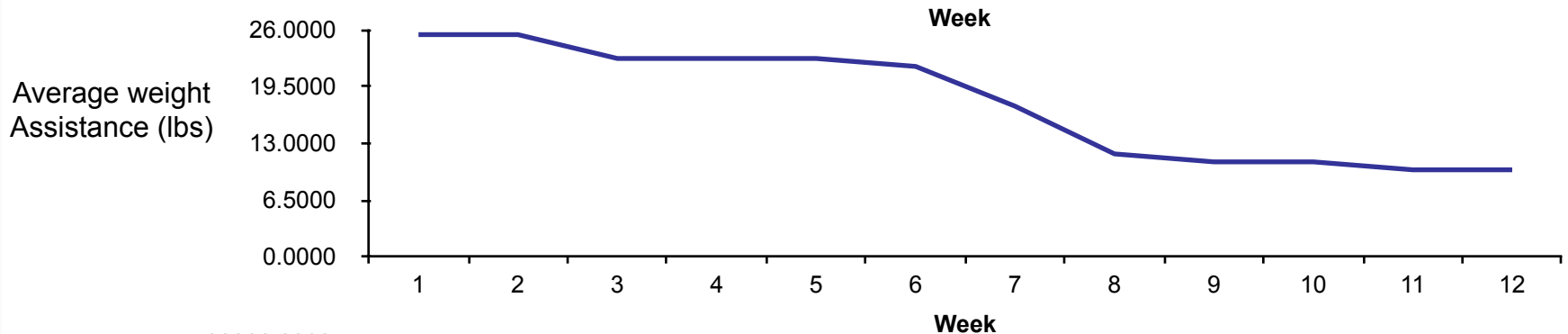
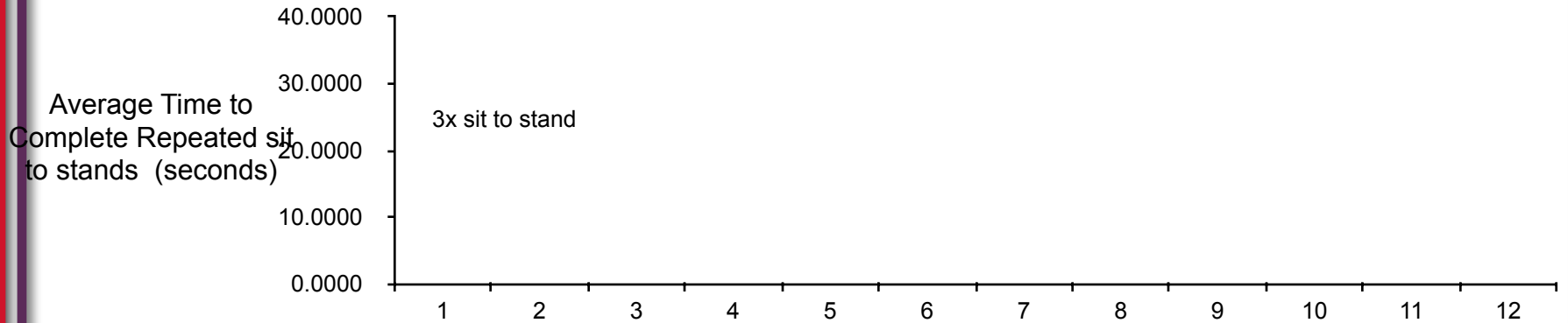
Time to Complete Repeated sit to stands



— 3 times sit-to-stand
— 5 times sit-to-stand

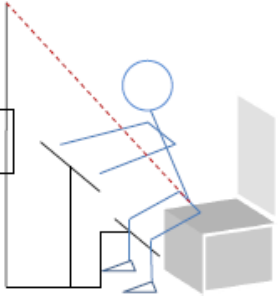


Weekly Trends During Training



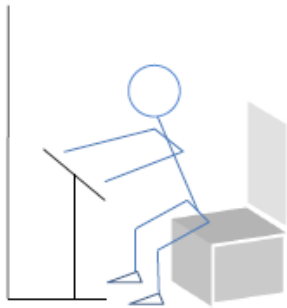
Progression of Support / Assistance

Weight assistance, hand support and knee pad support



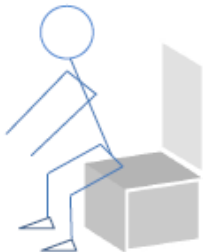
- Counterweight provides assistance for moving the body off the seat
- Hand support stabilizes the body and pulling against the bar helps move the body off the seat
- Knee pad stabilizes the lower body and provides a fulcrum for moving the body forward and off the seat

Hand support only



- Body weight is lifted off the seat entirely by muscle force
- Hand support stabilizes the body and pulling against the bar helps move the body off the seat
- Legs are independently stabilized

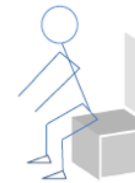
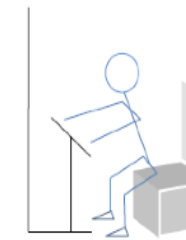
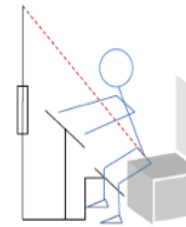
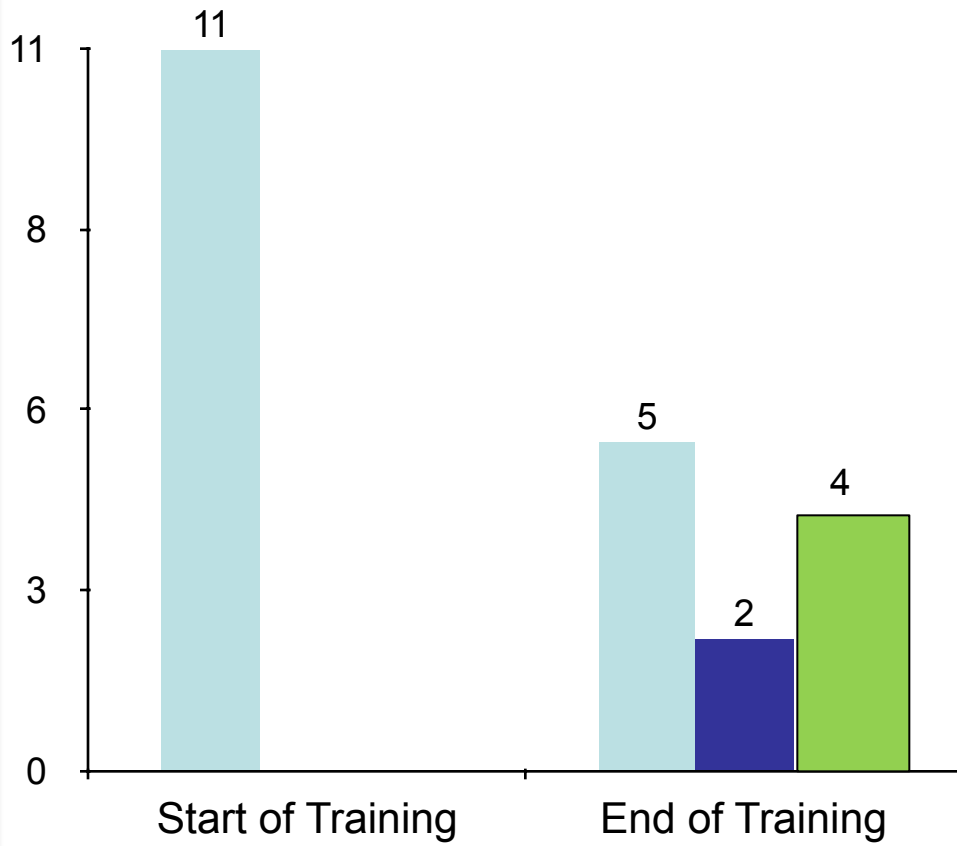
Independent



- Lifting the body off the seat requires muscular force and speed – to develop enough angular momentum for lifting the body off the seat
- The body is stabilized independently



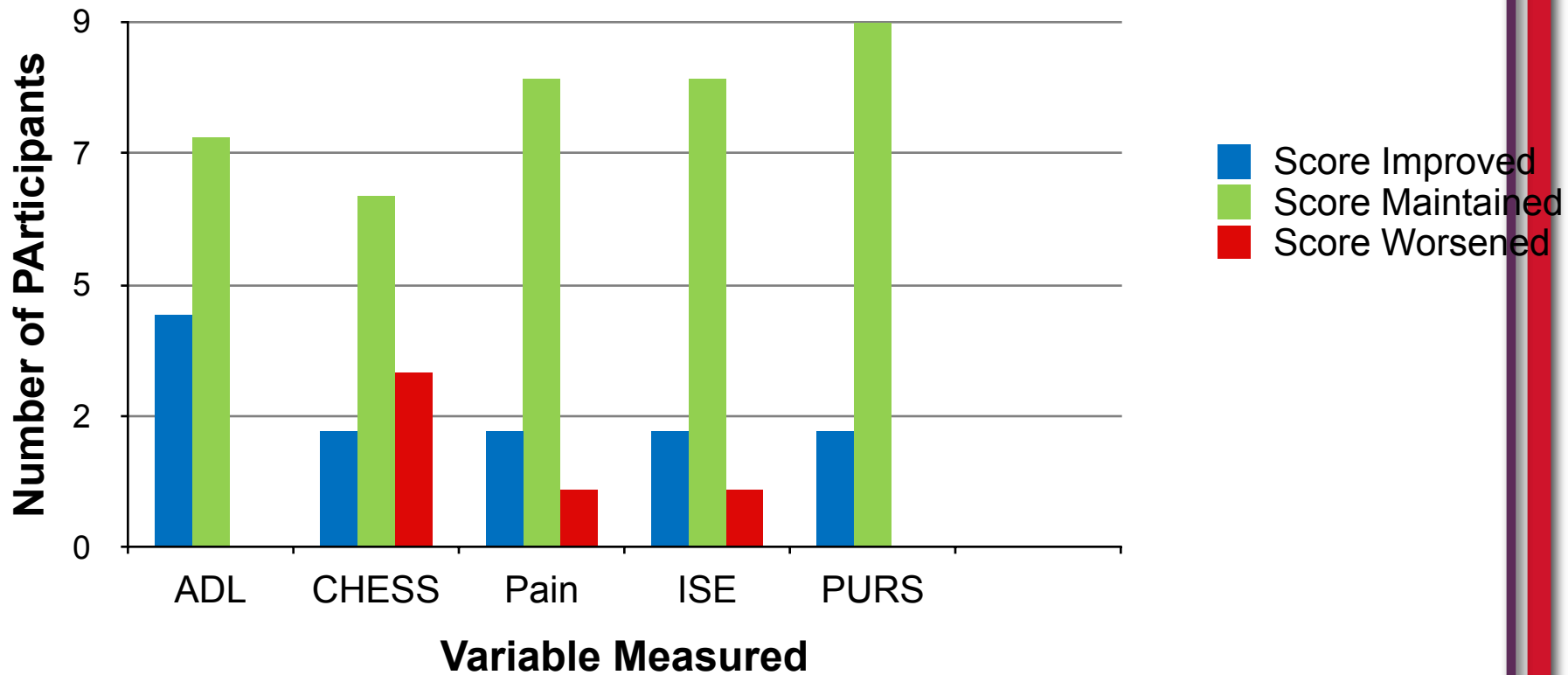
Support / Assistance Required for 5x sit to stand



- Counterweight, hand and
- Hand Support only
- Independent



Changes in RAI MDS 2.0 Scores After Training



ADL – activities of daily living scale
CHES – changes in health, end stage disease, signs and symptoms

Pain – Pain scale
ISE – index of social engagement
PURS – pressure ulcer risk scale



Conclusions

- Enabled movement training with progressively reduced body weight support and biofeedback training with progressively increased speed improved the ability to perform repeated sit to stand movements measured by time to complete 3 and 5 consecutive sit to stands
- 4 of 11 participants were able to perform 5 consecutive sit to stands without assistance at the end of the training program
- 4 of 11 participants (not the same 4 as above) improved their ADL scores (measured by RAI MDS 2.0) after the training program
- Training with body weight support and speed sensitive biofeedback improved the ability to stand from a chair, these improvements appear to be associated with positive outcomes on the RAI MDS 2.0



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