



**School of Sport & Exercise Sciences  
The Medway Building  
Chatham Maritime  
Kent. ME4 4AG**

**Contact No.: 01634 888811  
[s.meadows@kent.ac.uk](mailto:s.meadows@kent.ac.uk)**

**Medway Working Age Group (MWAG) & School of Sport & Exercise Sciences  
Parkinson's Disease (PD) Exercise Project**

**Progress Report 26.10.2017**

### **Introduction**

The Parkinson's Disease (PD) exercise class is a joint venture undertaken by The Medway Working Age Group (MWAG), the School of Sport & Exercise Sciences (SSES) at the University of Kent and Parkinson's Equip, who provide the funding for the venture. The first exercise session took place on 04.10.2016 at St Mary's Island Community Centre (SMICC). Therefore the exercise class has been running for just over 12 months.

### **Supervision of Exercise**

The session is supervised by Dr Steve Meadows, a Senior Lecturer from SSES and Roisin Sullivan, who is a pulmonary and stroke rehabilitation professional, and recent graduate from SSES. Supervision is also provided by two other members of SSES staff who volunteer (Deana Stephens and Emma Mundy). Current undergraduate and postgraduate students from a variety of courses run by SSES also volunteer to help at the sessions. This has provided a rather unique situation where there is a high ratio of instructor / assistant instructors to participant ratio (approximately 1:2). This does fluctuate on a weekly basis, depending on attendance by participants and availability of volunteers, but regular attendance by volunteers is encouraged to promote rapport with class participants and a team approach to session delivery.

### **Attendance Profile**

When the session launched there were 15 participants. As with any exercise class attendance fluctuates, people leave and new people join. There are currently 22 names on the class list with one person awaiting their initial evaluation before starting exercise. Most live in the Medway area, but one participant travels from Dartford (15 miles from Chatham) as there is no similar exercise opportunity currently available in that area of Kent. All class participants have a Parkinson's diagnosis. The average age of class participants is 62 years with an age range of 44 to 82 years. These figures were calculated from participant's age at 04.10.2016.

The session is currently running near capacity for the physical space. All those who attend came through the MWAG, or by word of mouth. SSES have information relating to the PD work on their webpage (<https://www.kent.ac.uk/sportsciences/people/profiles/meadows-steve.html>) with more web content being developed.

As can be seen from **Figure 1** the general profile has seen a gradual increase in attendance (dotted trend line) over the last 12 months. This will inevitably plateau due to limitations of the physical space available. A comfortable maximum number of participants would be 20 per session.

The mean attendance is 16, which has remained stable since the last report. The range of attendance is 9 – 23 participants.

Retention has not been an issue. Drop-outs are usually for medical reasons (worsening Parkinson's symptoms or co-morbidities), but vacancies have been filled by new members joining the group.

A number of carers also attend the session at SMICC, but do not participate in the physical exercise. They usually congregate in an adjoining meeting room and utilise it as respite or social time.

### **Data Evaluation**

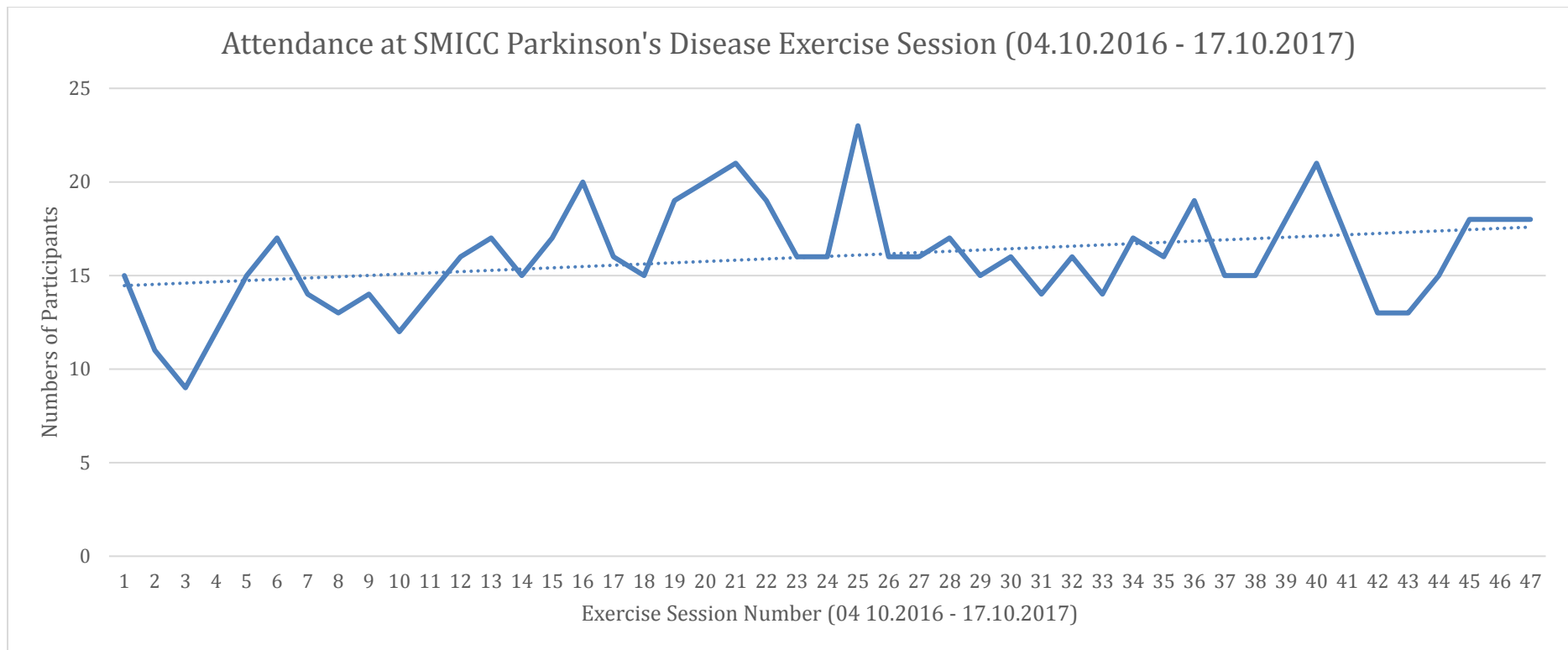
Periodic testing sessions are undertaken approximately every 3 months. Standardised health measurements are used taking height, weight, body mass index (BMI) and waist circumference. These are important to monitor whether participants are achieving / maintaining a healthy weight. Being overweight or obese can increase the risk of cardiovascular and other diseases. Resting measurements of heart rate and blood pressure are also taken.

Standardised functional tests are used:

- The 6-minute Walk Test requires participants to walk as far as they can in 6-minutes, so this provides an indication of walking speed and addresses symptoms like bradykinesia (slowing of movement).
- The Timed Up & Go requires the participant to stand up, walk across a level surface for 3 metres, turn, walk back and sit down. This measures leg strength, balance and speed.
- 1 Minute Sit-to-stands is the number of repetitions of sit-to-stands that can be performed in 1 minute and measures strength endurance of the leg muscles.
- Grip strength provides a surrogate measure of upper limb muscle strength, but also indicates symmetry between the left and right upper limb.

Data collection supports involvement of SSES and the University of Kent's expertise provides a robust means of evaluating the effectiveness of the venture, as well as providing class participants with feedback on their physical function.

**Table 1** shows the 'hard data' from the health and functional tests performed on participants. With the passage of time and new people joining the session the results from the testing sessions has changed from my last report and this has been reflected in this updated report. All figures are reported as group means. Individual achievements will be lost in this group profile. Group data provides the most economical and normal method of reporting. I hope the data in Table 1 makes some sense of the potential tangible health benefits regular exercise can provide for those who attend. The 'Comment' column in the **Table 1** provides a brief snapshot evaluation of the criteria being measured over the 4 assessment periods (12 months for some participants).



**Figure 1. Attendance Profile at SMICC Parkinson's Disease Exercise Class (04.10.2017 – 17.10.2017)**

**NB. The solid line indicates actual attendance for each session. The dotted line indicates the attendance trend over the 12 months.**

**Table 1. Health & Functional Capacity Data (updated for period 04.10.2016 – 17.10.2017)**

Criteria	Pre-exercise Measurement #1 (n = 22)	Measurement #2 (n = 22)	Measurement #3 (n = 20)	Measurement #4 (n = 14)	Comments (trends over the 4 measurement period – 12 months)
Weight (kg)	85.64	83.55	83.44	81.61	Decreased
BMI (kg.m <sup>2</sup> )	28.94	28.67	29.14	29.03	Slight increase (ideal < 25)
Waist Circumference (cm)*	99.33*	97.78*	97.55*	97.89*	Slight decrease*
Systolic Blood Pressure (mmHg)	137.08	126.78	135.65	124.86	Decreased (ideal < 140)
Diastolic Blood Pressure (mmHg)	81.88	78.70	83.15	77.86	Decreased (ideal < 90)
Resting Heart Rate (bpm)**	75.40	75.00	74.85	74.57	Slight decrease (normal range 60 – 80)
6 Minute Walk Test (m)	430.04	422.77	446.65	432	Slight Increase - walked further
Timed Up & Go (secs.)	9.28	8.36	8.43	8.65	Slight decrease – quicker getting up out of a chair & walking 3m to return to a chair
1-Minute Sit-to-Stand (reps)	20.02	22.61	23.70	23.57	Did more repetitions indicating improved leg strength and balance
Grip Strength (Left) (kg)	31.37	30.98	29.23	27.21	Decreased – losing strength
Grip Strength (Right) (kg)	32.06	31.85	31.33	30.08	Decreased – losing strength

\*healthy waist circumference depends on whether participant is male (<102cm) or female (<88cm)

\*\*bpm = beats per minute

## **Discussion**

Some measurements are subject to natural fluctuation (e.g. weight, blood pressure, and resting heart rate) in any population, but with PD there can be good days and bad days. Generally, we do not test people if they are having a bad day, but if energy levels are low, performance in things like the 6-minute walk test will be compromised. Most of the assessments are performed in the evening, so participants may not be at their physical optimum following a day at work, or performing everyday tasks. So the values may under-represent what this group could achieve.

As in my last report, health and performance appears to be maintained over the 12 months – which is a positive message for a population with PD, a neuro-degenerative condition. The general trends in the last 12 months are:

1. participants lose a bit of weight (approximately 4kg);
2. some further weight loss could be encouraged to promote a healthier BMI (ideal < 25kg.m<sup>2</sup>);
3. systolic and diastolic blood pressures are in normal healthy ranges;
4. walking speed over 6-minutes is improving, suggesting ability to maintain a sustained bout of walking is not deteriorating over time;
5. walking, standing-up and turning speed in the timed up and go improves by approximately 7%;
6. ability to perform sit-to-stands has shown a 15% improvement;
7. upper limb muscle power needs to be promoted as right and left grip strength worsens over time (grip strength exercises are now routinely used in the circuit exercise).

## **Future Work (The Next 6 months)**

Since January 2017 SSES have been running a research project alongside the session collecting blood samples from class participants who voluntarily opt to be a part of this parallel research work. We are investigating blood-derived neurotrophic factor (BDNF) levels in the blood samples pre- and post-exercise, and levels across a time period of 3 months. An SSES colleague, Dr Glen Davison, has conducted some analysis on the blood samples and a poster illustrating these results is included as a separate attachment sent along with this report.

Anna Ferrusola-Pastrana has joined SSES as a 3-year PhD student. She will be looking at ways to extend the research work into exercise and PD, and is already busy preparing the next phase of this. She will be presenting the preliminary BDNF data at a mini-conference in Derby next month. Anna also attends the Tuesday evening exercise session as a volunteer.

### **Future Challenges (> 6 months)**

1. Exploring a sustainable funding model to ensure the exercise class venture continues – this will be done in conjunction with MWAG and the Head of School for SSES. This remains a priority for both MWAG and SSES.
2. Investigating other opportunities for people with PD to engage with exercise. We have potential opportunities for boxing and yoga classes as well as possible alternative locations for multi-modal exercise (e.g. Cyclopark, Gravesend).
3. Exercise leadership – identifying suitable candidates from the SSES student community to lead exercise sessions for people with PD in Medway and surrounding areas.
4. Strike a balance between the community engagement aspect of our work and evidence-based practice provided from the research projects.

### **Personal Reflection**

I am often humbled by the effort expended by the PD class participants. The dedication and commitment to the sessions would put many people to shame and they continue to be enthusiastic about their weekly exercise class. I am also indebted to my students and colleagues who continue to give up their Tuesday evenings to support this work, but more importantly the class participants with PD. It would not be possible without you. Particular thanks to: Roisin Cox, Deana Stephens and Emma Mundy.

### **Final Comments**

Parkinson's Equip has made all this possible – thank you. Please do not hesitate to get in touch if you have any further questions or need clarification on any of the points raised in this report. I am happy to answer any questions via a conference telephone call, or skype, to your board meeting.

Kind regards,

**Dr Steve Meadows**  
**Senior Lecturer, SSES, University of Kent.**  
**26.10.2017**