Evaluation Report –
Move it or Lose it! & Birmingham CrossCity CCG

Abstract

Chronic Obstructive Pulmonary Disease (COPD) is estimated to cost the NHS £1 billion per annum (Keogh & McLean, 2016) for direct healthcare costs, and results in 115,000 emergency hospital admissions in the UK (NHS England, 2014).

Pulmonary rehabilitation in the form of exercise has been shown to elucidate positive effects on COPD patients (Puhan et al., 2012). *Move it or Lose it!* are specialists in exercise for the over 60s and have been commissioned by Birmingham CrossCity CCG to deliver exercise classes called FABS (Flexibility, Aerobic, Balance & Strength) to COPD patients in an initiative to promote health and well-being. Following a successful pilot study, the programme has been rolled out across the CCG.

The aims of the programme are to; 1.) improve patient health and quality of life, 2.) educate and empower patients to take control and self-manage their condition, thus reducing time for GP appointments, hospital admissions and their associated costs. and 3.) monitor and evaluate the physical and psychosocial function of the patients.

So far, forty-three COPD patients (mean age range 60-70 years) have completed a once weekly 45-minute exercise class, followed by educational group discussions based at their GP surgery. Timed Up and Go (TUG), 30 second sit to stand and self-report questionnaires were used to monitor and evaluate physical and psychosocial elements of health and wellbeing.

Results indicated mean group improvement of 44% in TUG and 150% improvement in 30 second sit to stand scores, demonstrating improved lower limb strength, functional mobility and independence. Questionnaires highlighted elevated mood and energy levels and high levels of enjoyment and social interaction. Correlation coefficient (*r)* scores showed strong to very strong positive correlations in results from different instructors. Patients have also reported a reduced need for medication during the 12-week programme and this was sustained after a six week follow up.

Prevalence of COPD

There are over 1.5 million diagnosed cases of COPD in England (Public Health England, 2017) with 4.5% of people aged 40 and over living with diagnosed COPD (British Lung Foundation, 2012). The prevalence of COPD has been increasing steadily over the last decade, with the highest number of cases in the North East, North West and Scotland (British Lung Foundation, 2012).

Within Birmingham City and the West Midlands prevalence is higher than national average according to Public Health England statistics as shown in the table below.

Table 1. Prevalence of COPD by CCG and value vs the national benchmark

Area	Number of cases*	Value**
England	*1,509,108*	*2.91*
Birmingham Cross City CCG	25,613	3.43
Birmingham South and Central CCG	18,076	3.16
Sandwell and West Birmingham CCG	7,657	3.44
Redditch and Bromsgrove CCG	4,217	2.47
Solihull CCG	7,759	3.33

*Data from Public Health England, fingertips.phe.org.uk
**Indicates above or below national benchmark

Cost to NHS

Emergency admissions related to COPD typically cost CCGs £2,288 per patient. This doesn't include ongoing costs of medication, hence it is advised that patients undertake pulmonary rehabilitation, which has been shown to improve their condition.

However, it is reported to cost £208 per patient to instigate pulmonary rehabilitation (PR) for resources and staff. This includes the nurse, physio, instructor and venue hire costs (NHS Scotland, 2011). Further literature states that PR can cost £199 - £249 per patient with adherence levels to PR programme at around 50% (Hayton et al., 2013). This is an expensive and time-consuming process that often leads to readmission of patients who do not complete the PR programme. Given the prevalence of COPD as shown above, the services to enhance COPD patient's quality of life need to be highly cost-effective and time efficient. Improving the pulmonary rehabilitation service offered could help improve adherence levels and consequently reduce treatment and admission costs as a result (Cecins, Geelhoed & Jenkins, 2008).

Our solution to the problem – what we have done

At *Move it or Lose it!* we are specialists in exercise for the over 60s and those with health conditions. We have created the FABS Training Programme in conjunction with collaborating partners, The Centre for Healthy Ageing Research at the University of Birmingham. FABS incorporates Flexibility, Aerobic, Balance and Strength exercises

into every class as well as the opportunity to socialise and have fun. The exercises are evidence based, safe, fun and effective.

After a 12-week pilot study, the programme proved to be successful and thus has been commissioned by Birmingham CrossCity CCG, running sessions in the Northfield Alliance.

The Move it or Lose it programme can significantly reduce the cost of providing PR, providing a weekly 45-min class for up to 15 patients, for a fraction of the current £249 per patient. The classes take place at the GP surgery and so negate the need for venue hire costs. This also includes education on health and lifestyle discussed at the end of each exercise class to help empower the patients to take control of their condition and help them take steps to improve their lifestyle.

The programme lasts for 12 weeks and includes assessments of physical function and mental wellbeing to monitor progress. Every two weeks, the Time Up and Go test is used to measure functional mobility and the 30 second sit to stand tests are used each week to monitor lower limb strength and aerobic capacity. Both assessments are associated with levels of independence and quality of life. (Al Hadaad et al., 2016; Puhan et al., 2012).

Mental wellbeing is measured via a unique 'traffic light' metric that quickly and efficiently gives insight into the patient's mental state. The metric was developed following pilot testing indicating long questionnaires with lots of text are not user friendly for the patient.

Results

The results in this report are collated from seven 12-week intervention programmes across five different GP surgeries, using 42 patients with an average age range of 60-70 years.

The 30 second sit to stand

This test involves standing up from a chair and sitting down again as many times as possible in 30 seconds.

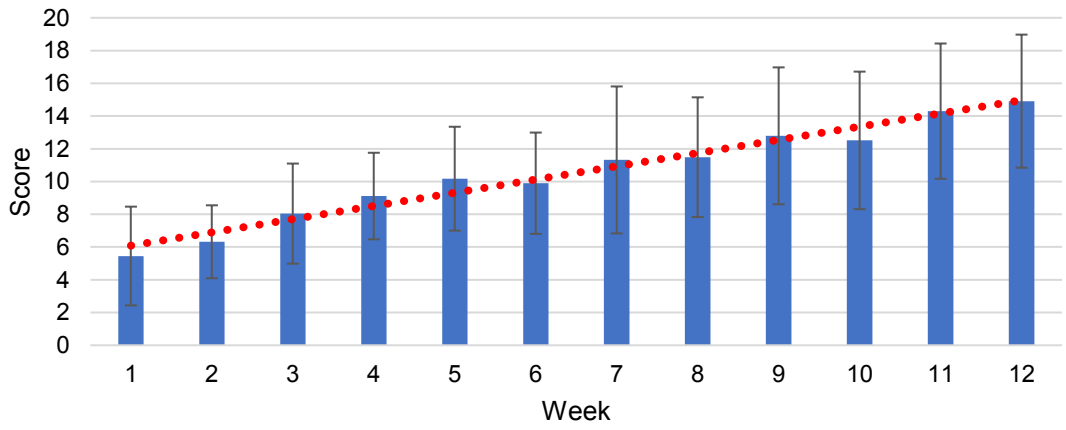

Figure 1. Mean and (±SD) 30 second sit to stand scores across the 12-week programme

The scores indicate a 150% improvement from mean score of 5 (±3) in week 1 to 15 (±4) in week 12. Some individual cases show improvement of ~200% from 6 to 22 across the 12 weeks.

The figure above clearly demonstrates this trend of improvement and impact the classes have had on lower limb strength.

Timed Up and Go

This test involves standing from a chair, walking 3 meters to a marker, turning 180° around the cone, walking back to the chair and sitting down.

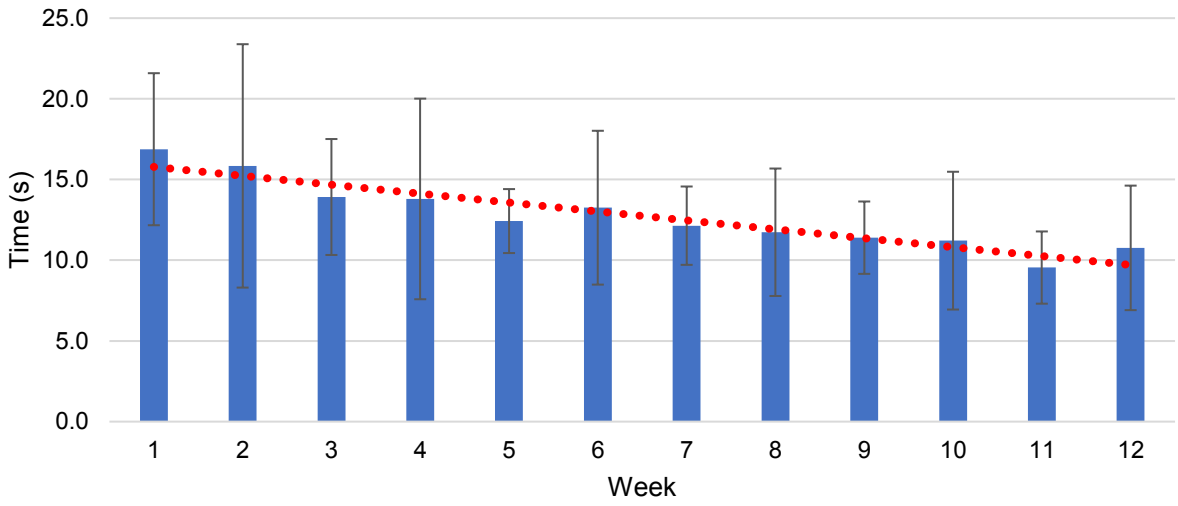

Figure 2. Mean and (±SD) Timed Up and Go times in seconds across the 12-week programme.

The scores indicate a 44% improvement from mean times of 16.9sec (±4.7) in week 1 to 10.8sec (±3.9) in week 12. Some individual cases show improvement resulting in a sub 10 second time in week 12, which is in line with age matched normative values of healthy individuals.

The figure above clearly demonstrates the reduction in times taken to complete the assessment indicting improved walking gait speed and functional mobility, which is also related to reduced falls risk.

Wellbeing Data

The following data highlights the impact of the classes on mental and physical wellbeing. This is subjective data gathered using our unique metric. Patients will ask how they today, and select either red (1), amber (2) or green (3), thus the higher the score the better the patient is feeling.

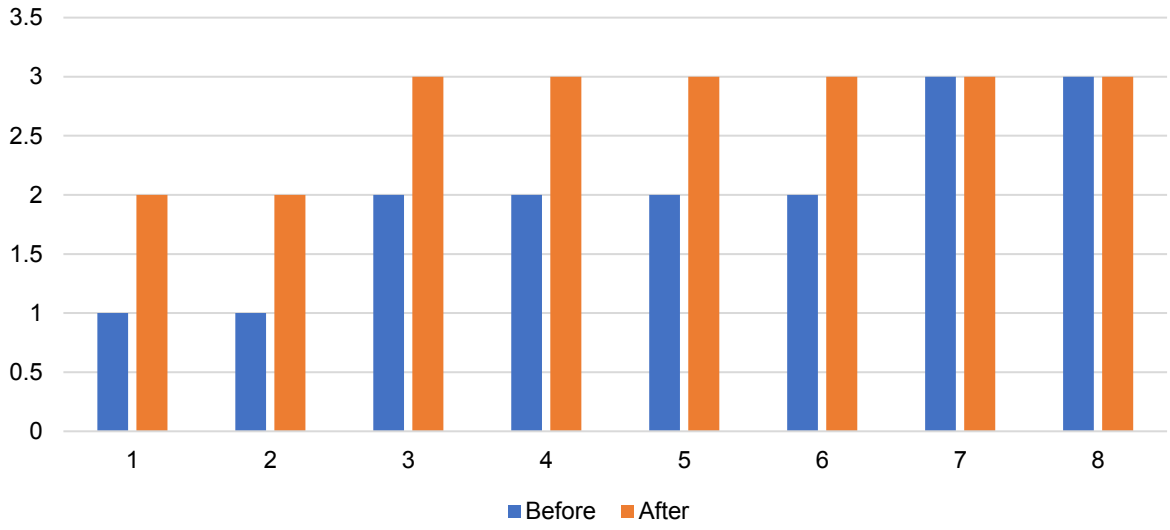

Figure 3. Physical wellbeing before and after the exercise session.

It is clear from this data that over time, patients begin to feel better about their physical condition. They always feel better physically after the class.

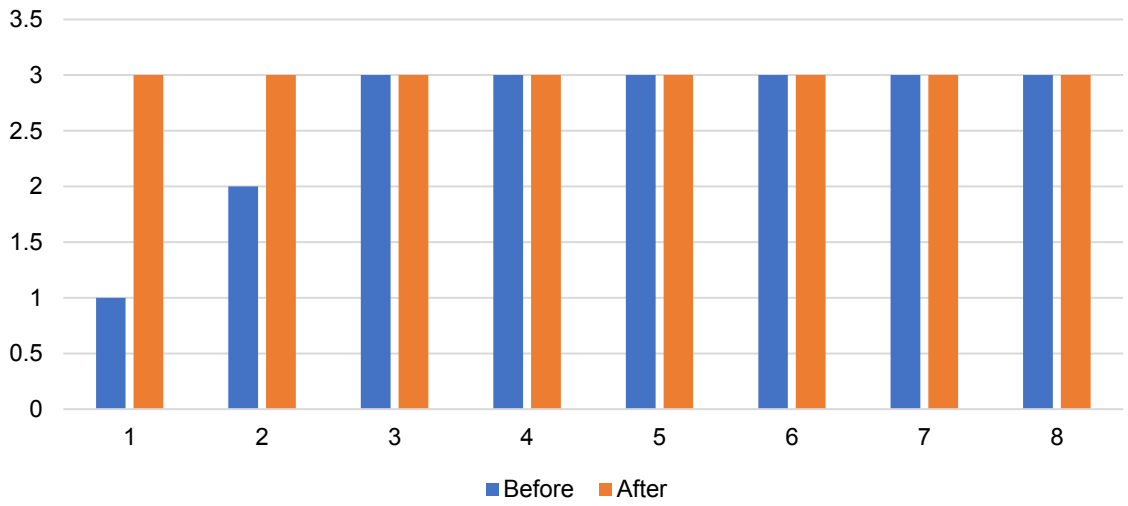

Figure 4. Mental wellbeing before and after the exercise session.

It is clear from this data that over time, patients begin to feel better about their mental wellbeing. They always feel better after the class suggesting the class 'lifts their spirits', and enhances their mood.

These findings correlate with the comments patients make, as shown below.

Patient Feedback

Comments, thoughts and opinions from patients about the exercise sessions have been recorded throughout each 12-week programme. Table 2 below reports a summary of these categorised as positive or negative.

Table 2. Summary of comments from patients during the 12 weeks.

Week	Positive	Negative
1	"Good meeting today, easy so far but sweating a lot"	"Tiring"
2	"Quite enjoyable today" "Exercises helpful, no problem with breathing today" "I will try to do a bit at home" **"Very good, learnt a lot in 1st and 2nd lesson, will carry on at home"**	"Mostly enjoy, but find it a bit easy"
3	"I am beginning to feel better" "I really enjoyed it. The exercises were good" "Feeling more confident with day to day living"	
4	"Feel as if I've had a workout" "Stronger" **"I am getting quite a lot of good advice about keeping active"**	
5	"I think I am getting better, I know I am beginning to feel better" "Really enjoyed the exercise class today, just getting out and travelling on the bus to get here get's me moving and more motivated"	

6	"I am enjoying these classes, it is helping me being with other people who have the same problems that I have as I feed off what they say". **"Helping me a lot concerning my breathing"**	
7	"Best week so far, feel good" "I can now stretch my arms behind my back" "Breathless at first but better as progressed"	"Struggling"
8	**"Breathing easier to control"** "Daughter noticed how exercises are helping"	"Ache across the back"
9	"Feel better than when I came"	"Struggling today, but feel the weather is to blame"
10	"Love the class even though can't always do them" **"Love the friendship"**	
11	"Breathing better, more movement in joints" **"I really have enjoyed the 'Move it classes' it's really changed my life, thank you"** "Loved it"!	"Not so well this week but had a go"
12	"I think my daily life has improved coming to the meetings" **"I do intend to carry on with all the exercises while at home"**	"So sad it has come to the last class"

On the final week of the programme, patients are asked for an evaluation from completing a simple form. Table 3 below shows the responses from the patients, with the majority identifying the benefit of the 12-week programme. Most encouraging is over 90% of patients report that they have enjoyed the sessions and that they feel their quality of life has improved as a result. This is important for exercise adherence and behaviour change, as many of these patients have previously not exercised or been active. Due to our network of community classes, at the end of the 12 weeks we can signpost patients onto a class to continue being active. This will reduce the likelihood of readmission and emergency admission for COPD related issues.

Table 3. Scores from the final evaluation questions shown as a percentage (%).

Question	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
1. I have enjoyed the exercise classes	3	0	16	**81**	0
2. The exercise classes have improved my quality of life	0	3	**53**	43	0
3. I am able to be more active now, than before I started the classes	0	3	38	**48**	10
4. I feel my COPD has improved since starting the classes	0	6	**45**	39	10
5. The classes have given me more control over my COPD	0	6	36	**42**	15

Reliability

To demonstrate repeatability of the intervention, group mean scores have been correlated. When considered that a score of 1.0 is a perfect correlation, results suggest a strong to very strong positive correlation of all measures. This demonstrates that the programme is effective and reliable, despite using three different instructors to deliver classes to 45 patients across five GP surgeries the results are consistently positive.

Table 3. Correlation coefficient (*r*) scores

Measure	*r*
Timed Up and Go	0.82
30s Sit to Stand	0.93
Psychosocial	0.74

Summary

The results from this report have demonstrated that FABS exercise classes are a reliable and effective exercise intervention suitable for COPD patients. This is in line with literature reporting the benefits of exercise for COPD patients (Puhan, Gimeno-Santos, Scharplatz, Troosters, Walters and Steurer, 2011).

The evaluation of physical and psychosocial function of the patients has reported positive results indicating improved lower limb strength, as demonstrated by increased 30s sit to stand score, and improved mobility as shown by decreased Timed Up and Go times. Both results indicate a reduction in falls risk and an increase in independence and health related quality of life, particularly in respect to the 30s sit to stand as reported by Puhan et al., (2012).

Moreover, patients have noticed the benefits of the exercise classes and reported an improved perception of their condition as highlighted in the patient quotes and class evaluation form. Further, patients feel their condition is easier to control or have noticed improvements extending to beyond the class environment and into daily life (Table 1 & 2.). It's also important to note the enjoyment levels of the class were high which is good for adherence levels to the exercise classes and increases the likelihood of patients continuing to attend classes. Indeed, the mean adherence rate was 66%, which is higher than rates reported for pulmonary rehabilitation in the literature (Hayton et al., 2013).

Regardless of using different instructors to lead the exercise classes in each GP surgery, correlation coefficient scores to each measure have indicated very high repeatability and reliability. This strengthens the case for scaling the classes into a national programme to improve physical and mental wellbeing in patients with COPD, and with the potential to aid those with frailty issues.

There is much literature to support the use of exercise interventions to reduce GP admissions and associated costs. In the frail elderly, the number of falls reduced by 46% following a home-based exercise programme, which resulted in reduced costs for admission and treatment (Robertson, Devlin, Gardner & Gardner 2001).

This has also been shown in COPD patients in a study by Garcia-Aymerich, Lange, Benet, Schnohr & Antó (2006), who reported reduced hospital admissions and mortality rates in COPD patients who partook in regular physical activity. The authors suggested regular physical activity should be encouraged in COPD patients for the benefit to public health. These positive benefits of exercise to treat COPD to reduce admission, mortality and increase quality of life are echoed in a large-scale review by Puhan et al. (2011).

It therefore seems clear that running FABS within the GP surgery is a highly cost-effective and efficient way to improve patient health and reduce medication needs and GP admissions.

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