

**PACE-UP Next Steps: online resource and app development and feasibility testing for implementation of the PACE-UP walking intervention in 45-75 year old primary care patients -  
a short report**

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**Rationale for implementing PACE-UP**

The PACE-UP trial was a pedometer-based walking intervention with long-term objective follow-up. Full details of the trial protocol have been published previously<sup>1</sup>. Briefly, the PACE-UP trial recruited 10% of those invited (1023/10,467) and 12 month findings showed significant effects of both interventions on the primary outcome, steps/day and the main secondary outcome, weekly time spent in moderate-to-vigorous physical activity (MVPA) in bouts<sup>2</sup>. Additional steps/day compared to the control group were 677 for nurse support (95% C.I. 365-989) and 642 for postal (95% C.I. 329-955). Additional MVPA in bouts (minutes/week) were 35 for nurse support (95% C.I. 19-51) and 33 for postal (95% C.I. 17-49). There were no significant differences between the two intervention groups at 12 months<sup>2</sup>. We also showed that the postal intervention was cost-effective in both the short and long-term<sup>3,4</sup>.

*Findings from 3-year follow-up*

67% of the original trial cohort (681/1023) provided physical activity (PA) outcome data at 3 years. Findings at 3 years showed persistent intervention effects, again with no statistically significant difference between the nurse and postal groups. Additional steps/day compared to the control group were 670 for nurse support (95% C.I. 237-1102) and 627 for postal (95% C.I. 198, 1056). Additional MVPA in bouts (mins/week) were 24 for nurse support (95% C.I. 3, 45) and 28 for postal (95% C.I. 7-49)<sup>5</sup>. We also had very positive comments from participants about the intervention in terms of helping them to maintain their physical activity levels in the longer term<sup>6</sup>.

*The case for implementation*

These findings taken together suggest that a pedometer-based intervention, delivered either by post with minimal support or with additional nurse support can bring about significant increases in both step-counts and time in MVPA in a cost-effective manner, with persistent effects still present at 3-year follow-up. From other literature we know that sustained increases in step-counts and MVPA of these sizes can lead to significant health effects, in our main trial outcomes paper we estimated the approximate reductions in risk

that could be achieved e.g. reductions in heart disease of approximately 4.5% (95% C.I. 3-6%) and all-cause mortality of approximately 4% (95% C.I. 1-7%)<sup>7</sup>.

We therefore believe that PACE-UP is an effective and cost-effective intervention that could be rolled out in routine primary care, which could make an important long-term contribution to addressing the public health physical activity (PA) challenge. There are however some important outstanding questions that need to be addressed before implementing at scale in the NHS.

1. *New Technology.* Since the trial was undertaken there has been a dramatic increase in the use of wearable technology for measuring personal PA levels (e.g. smartphones, Fitbits, Garmins, etc) online monitoring and PA mobile apps. Further research into how the PACE-UP 12-week PA programme could be integrated into use of these new technologies is needed, specifically through development of both online support and development of an app to support the paper-based intervention.
2. *Recruitment.* Recruiting randomly selected participants aged 45-75 years through the post resulted in an uptake of only 10% overall and with differential uptake, lower in socio-economically deprived groups and South Asians<sup>8</sup>. Could we increase the reach of our intervention by recruiting through primary care consultations with a GP or nurse for chronic health conditions where a PA intervention is indicated (for example through diabetes clinics)? Could we also increase recruitment by offering the intervention as part of an NHS Health Check, where low PA levels have been identified?

### **PACE-UP Next Steps implementation study**

In 2017 we began PACE-UP Next Steps which was a feasibility study attempting to address these outstanding questions.

This work was funded by small awards from two sources; the CLAHRC (Collaboration for Leadership in Applied Health Research & Care) South London and from St George's University of London, Strategic Development Award which together provided support to develop a PACE-UP next steps website and PACE-UP next steps mobile app over 4 months and research assistant support for a 6 month roll out in local practices.

#### *1. New Technology*

##### *PACE-UP next steps website*

Technology has moved on since 2012 when the PACE-UP trial first started, so we developed an online version of the PACE-UP paper-based intervention (handbook and diary) to give participants the option to use the

walking programme digitally either instead of or alongside the paper based resources. We were mindful that we had long-term effectiveness and cost-effectiveness data on the pedometer plus paper-based resources which were based on effective behavioural change techniques, so the website was designed to promote the same techniques and to complement the paper-based materials and relied on participants using a pedometer and entering their step-counts.

The website was developed in-house by a staff member at St George's University and was tested by 10 members of the Population Health Research Institute, logging on, entering data and following the programme using the online approach. These testers provided helpful constructive feedback and the website was adapted in the light of their comments and suggestions. A mobile friendly interface was developed so that the website could be used easily from mobile phones.

We also planned to develop a PACE-UP next steps mobile app and to use this with participants. We worked with the e-learning unit at St George's University of London to develop the app, which needed to build on the website. Unfortunately, we had limited funding for app development and a tight timescale before we needed to do the feasibility study with primary care patients and despite developing the app and getting it adopted by both the apple store and google as an app, we ran out of time for testing and development and making necessary adaptations. When we were due to start recruiting patients in practices for the feasibility study we had to make the decision that the app was not ready to be rolled out, as it was not of an adequate standard, often crashed and was unresponsive when data were being entered. We therefore decided not to roll out the app as part of this implementation work, instead we just focused on making the website available to patients in the implementation work.

## 2. *Recruitment*

We recruited three practices in South London, involved in the original PACE-UP trial, to test three different recruitment methods:

- i) Face-to-face consultation involved recruitment of 45-75 year olds who were seeing either the GP or the practice nurse for a chronic health condition, where the practitioner assessed that PA levels were low and that the patient could benefit from a walking intervention. The health conditions were any that the practitioner felt would benefit from an increase in PA levels and included (but were not limited to) the following: type 2 diabetes; ischaemic heart disease; stroke or transient ischaemic attack; hypertension, chronic obstructive pulmonary disease, arthritis, back pain.

- ii) Face-to-face NHS health check involved recruitment of patients aged 45-75 years having NHS Health Checks who were identified by the nurse or health care assistant as having low PA levels, who might benefit from a walking intervention;
- iii) Postal NHS health check involved recruitment of 45-75 year old patients who had had an NHS Health Check in the last 12 months and were recorded on the GP system as having low PA levels, who might benefit from a walking intervention.

In both face-to-face methods the practice nurse / GP or health care assistant introduced the study to the patient during their consultations and if they were interested and wanted to proceed they were handed a pack including the appropriate patient information sheet and consent form. The pack also contained the PACE-UP patient handbook and PA diary, exactly as were used in the PACE-UP trial and details about online PACE-UP support, that could be used either alongside or instead of the paper diary to record their PA levels, according to their preference, with an individual login code. There was a freepost reply envelope to allow participants to return their consent forms.

For the group recruited by post following a previous NHS Health Check, a list of eligible patients was created at the practice by administrative staff searching on the practice computer system for those who had had an NHS Health Check in the last 12 months who were found to have low PA levels from the online questionnaire used as part of the NHS health check. A patient letter was then posted out from the practice, inviting them to participate, along with the appropriate patient information sheet and consent form. Once the consent form was received back at St George’s University, the research assistant posted out a pack containing a pedometer, the PACE-UP patient handbook and PA diary, exactly as were used in the trial, and also details about online PACE-UP support, with an individual login code.

We allowed each GP practice to choose which recruitment method/s they wanted to trial:

Recruitment method	GP practice		
	Wimbledon	Carshalton	Tooting
Consultations	✓	✓	
Face-to-face NHS Health Check	✓	✓	
Postal NHS Health Check	✓		✓

Table 1

*Monitoring patient recruitment*

Patient recruitment took place from 23<sup>rd</sup> August 2017 – 16<sup>th</sup> March 2018.

Recruitment figures for each recruitment route/GP practice were as follows:

	Wimbledon	Carshalton	Tooting	TOTAL
Face-to-face consultation	10	9	-	<b>19</b>
Face-to-face NHS health check	0	6	-	<b>6</b>
Postal NHS health check	13	-	4	<b>17</b>
<b>TOTAL</b>	<b>23</b>	<b>15</b>	<b>4</b>	<b>42</b>

Table 2

Of the 42 participants recruited: 25 (55%) were female; 26 (62%) were aged 40-59; 27 (64%) were white, 6 (14%) were Asian / Asian British, 5 (12%) were Black / African / Caribbean / Black British and 4 (10%) were other ethnic groups. This compares to the following figures in Table 3 from the PACE-UP trial; 656 (64%) female; 529 (52%) aged 40-59, 486 (47%) aged 60-74, 8 (1%) aged 75 and older; 790 (80%) white, 68 (7%) Asian / Asian British, 101 (10%) Black / African/ Black British and 25 (3%) other ethnic groups.

		PACE-UP Next Steps	PACE-UP main trial
Gender	Female	23 (55%)	656 (64%)
	Male	18 (43%)	367 (36%)
Age	40-59	26 (62%)	529 (52%)
	60-74	14 (33%)	486 (47%)
	75 and older	1 (2%)	8 (1%)
Ethnicity	White	27 (64%)	790 (80%)
	Asian/Asian British	6 (14%)	68 (7%)
	Black/African/Caribbean/Black British	5 (12%)	101 (10%)
	Other Ethnic Groups	4 (10%)	25 (3%)

\* 1 PACE-UP Next Steps participant did not report their gender/age

Table 3

Postal recruitment route:

We were able to monitor uptake easily through the postal NHS Health Check recruitment route as we could easily compare the number of letters posted out with the number of consent forms returned.

	Wimbledon	Tooting	Total
Packs posted out	60	74	134
Consent forms returned	13	4	17
%	<b>22%</b>	<b>5%</b>	<b>13%</b>

Table 4

Based on the 10% recruitment rate to the main PACE-UP trial Wimbledon exceeded this with an uptake of 22%. However, in Tooting which is a much more deprived and multi-ethnic area only 5% of participants returned a consent form, giving an overall uptake across both practices of 13%. This shows the value of trialling the same recruitment routes in different areas.

Face-to-Face recruitment route:

Monitoring reach through the face-to-face recruitment methods was more complicated as we were reliant on staff at the GP practices keeping a record of how many packs were offered to patients and recording how many packs were accepted. Although we provided staff at the GP surgeries with spreadsheets to facilitate recording of this information, this was a big ask on an already demanding work schedule. This meant we had some missing data, with one of the practices not able to provide any denominator data:

	Wimbledon	Carshalton
Packs offered during consultations	18	-
Packs offered during health check	1	-
Packs accepted	11	-
Consent forms returned	10	15
% recruited	<b>53% (10/19)</b>	-

Table 5

## Evaluation of PACE-UP Next steps

### Feedback from participants

In order to gather feedback from participants about their experience of taking part in PACE-UP Next Steps we sent all 42 participants a short questionnaire to complete. The questionnaire aimed to explore how easy the different resources were to use, any problems encountered, any suggestions for improvements and if participants monitored their PA levels which tools helped them.

In total we had 18 responses from the evaluation mail-out:

Not at all useful	-
Slightly useful	2
Moderately useful	5
Very useful	6
Extremely useful	5

Table 6

Of those that returned a feedback questionnaire the majority thought taking part in PACE-UP Next Steps walking programme was useful for increasing their levels of physical activity:

The majority also thought taking part in the PACE-UP Next Steps programme helped them to increase their activity levels.

Yes	13	If yes, by how much? <ul style="list-style-type: none"><li>• 8 said by a lot</li><li>• 3 said by a moderate amount</li><li>• 2 said by a little</li></ul>
No	2	
Not sure	1	

Table 7

The PACE-UP programme was well received, with 11/18 (61%) participants saying they would definitely recommend the walking programme to their friends or family:

Definitely would not recommend	-
Probably would not recommend	1
Not sure	1
Probably would recommend	5
Definitely would recommend	11

Table 8

We received many positive comments about the 12-week walking programme:

- "My wife and I walk from the village to Wimbledon instead of driving, feel better for it"
- "This project is a very good idea. It makes you motivated into wanting to improve fitness and encourages you by using pedometer and keeping record/track of steps."
- "I am more conscious now of my activity level"
- "The project made me more aware of the amount of time I can use to exercise. It is difficult to add time during week days, as I work, but I have definitely increased the amount of walking in my weekends"

There were also some constructively critical comments received:

- "Not sure why given to me as I was returning to running after an injury, my wife took pedometer and increased her walking. She bought a Fitbit as she enjoyed it"
- "There was a long lead time between receiving the kit and any contact from the research team. I found this something of a disincentive to taking part. Earlier contact a good idea I think."
- "The device broke down after 2 weeks. The programme coincided with TV/Newspaper articles challenging benefits of 10,000 steps"

For those that did not use the website their main reason was because they preferred to follow the walking programme using the paper resources:

I do not have a computer	2
I prefer to follow the walking programme using the paper resources	9
I could not work out how to log on	2

Table 9

Quotes supporting a preference towards the paper resources included:

- “I’m really bad with computers”
- “No I just find it easier to have paper resources on the table every morning: it helps me to remember to put the DIGI-WALKER on”
- “I am quite a technophobe. I’ve had to register all my distances in km since I don’t know how to change from km to steps on the pedometer. It has encouraged me to be more active though”

Only 5/42 (12%) of participants used the website. Although only 2/5 of these users provided feedback on the website they rated the features of the website highly and said the walking programme was ‘easy to follow’ online:

	Poor	Ok	Good	Brilliant
Look and feel			1	1
Usability			1	1
Functionality			1	1
Content			1	1
Navigation			1	1

Table 10

*Feedback from focus groups with health care professionals conducted at Wimbledon and Carshalton GP practices:*

We conducted focus groups with nurses and health care assistants who had been involved in handing out the PACE-UP packs, to gauge the acceptability of the different recruitment routes and to explore any particular successes or challenges.

The PACE-UP resources were well received by the health care professionals handing out the packs:

*“Patients don’t have to join a gym or go too much out of their own way, encouraging for people to look at pedometer and see how far they’ve walked is motivating”*

Health Care Professionals did not feel that going through the PACE-UP pack added that much time onto their consultations. Some even said that going through the pack with patients in detail (which took approximately 2-3 minutes) was actually quicker than handing the pack straight to the patients, waiting for them to look through it and then answering any questions.

There was a general consensus that it was beneficial to have both types of face-to-face recruitment routes (through consultations and NHS Health Checks) and that they complimented one another:

*“I don’t think you can separate it [the recruitment routes]”*

Those conducting NHS Health Checks said it was easy to hand out the PACE-UP packs as they were already having a conversation about how active the patients are:

*“When you get to a certain point in the health check you kind of feel, not that you’ve hit a brick wall but it’s kind of like you’ve gone through as much as you can with them and to have the PACE-UP pack there was actually like “oh we have got a pedometer here, we have got a walking programme if you want to take part in it” and they do seem really confident”*

There was a suggestion that the patients that attend an NHS Health Check are those that are generally more motivated to improve their health.

*“I don’t think there were any barriers apart from the time thing, I mean I don’t know with the NHS check it’s probably slightly easier because you’re having the conversation, the reason they have come is because they have some kind of motivation because they’ve actually attended an NHS Health Check appointment. It’s always the ones that come are the ones that are generally motivated. I think when you’re in an NHS Health Check and going through sort of all their different aspect of things, it is easier to bring [the PACE-UP pack] into the conversation as you’re discussing that anyway. Whereas with diabetes and some of the other consultations it is a slightly different slant I think”*

Health Care Professionals also noted some other barriers to “selling the intervention”, these included:

- Remembering to have packs in the consultation room: *“it’s not about forgetting to offer the pack, it’s about having the packs there to offer patients and if I have given two out it’s about remember to restock”*
- Uninterested patients *“I think the barrier was more the patient not wanting to commit”*
- Time constraints
- Concerns about how they spoke about the PACE-UP resources to patients *“I have a set blurb but I think a lot of it is how you sell it to patients, is it attractive enough? Do patients think they’ll be tied into it?”*

Health care professionals indicated that those attending the NHS Health Checks and chronic disease related consultations tended to be older patients that preferred to record their steps using the paper resources. However, whilst the Health Care Professionals felt there was a role for a simple intervention such as PACE-UP they also felt there was room for an app. They stressed that the app should have the ability to incorporate step activity from a smartphone to save participants in-putting this data.

#### **PACE-UP Next Steps – key challenges:**

Although conducting the PACE-UP Next Steps work helped us to understand how recruitment might work in routine primary care, unfortunately due to some challenges along the way it was not as fruitful as hoped. The aim was to recruit 40 patients through each of the recruitment routes (i.e. a total of 120) however, it quickly became apparent that this was an ambitious target, given the small scale of this project and the funding and time available and we were only able to recruit 42 patients in total.

Working in routine general practice means you have a lot less control over recruitment, than you would during a randomised control trial, and instead you are reliant on busy healthcare practitioners within the general practice. Due to time limitations in consultations it was difficult for staff to fill out the additional paperwork requirements needed for us to assess uptake of the face-to-face recruitment routes. Therefore we were unable to accurately determine the reach of these approaches.

Initially we thought we could develop the website and mobile app (to allow participants to follow the PACE-UP resources digitally) alongside one another. However it soon became apparent that the website needed to be up and running for the app to feed into it. Unfortunately, the app took a lot longer to develop than we anticipated, mainly due to limited staff time, limited budget which subsequently meant we ran out of time to test the finished result. We therefore had to make a decision not to roll out the PACE-UP app as part of the PACE-UP Next Steps work and to instead focus on the website and unfortunately only 5 of the 42 participants used the website.

## **Summary**

PACE-UP Next Steps recruited 42 patients from 3 general practices to test the feasibility of the PACE-UP trial materials and additional online support in routine primary care. Unfortunately, the PACE-UP next steps mobile app was not able to be tested with patients due to insufficient development time and difficulties with functionality. Of the 42 recruited patients, 19 were from face-to-face consultations, 5 from face-to-face NHS health checks and 17 were postal from those having previous NHS Health Checks. The response to the postal route was 13% (slightly higher than the 10% seen in the trial) but this varied between 22% in an affluent practice area and 5% in a more socioeconomically deprived practice area. Uptake from face-to-face offers was 53% in one practice, but was not recorded in the other practice offering this route. Recruitment of men and patients from non-white ethnic groups was higher in this implementation work than in the PACE-UP trial, particularly for the Asian/ Asian British ethnic group. Feedback from participants was mainly very positive, with most finding the PACE-UP Next Steps programme very or extremely useful and feeling that it had helped them to increase their physical activity levels. Only a minority of participants (5/42, 12%) tried out the online resources, despite all being given an individual login. Reasons for this included preferring paper resources and lack of confidence with online processes. Those who did try out the online resources found them easy to navigate and with appropriate content and good functionality.

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