SUSQI PROJECT REPORT

Effect of reducing physiotherapy referrals from care homes on waiting lists through health promotion, physical activity, and falls prevention.

Start date of Project: 02/05/2023 – 31/07/2024
Date of Report: 14/07/2023

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Background:

Physiotherapy is common following injury, surgery, illness, or disability. Physiotherapists promote health and well-being using excellent knowledge and skills to restore movement, mobility, function, and self-confidence through exercise, education, and other evidence-based treatments (1). The Community Therapy Team of the South Warwickshire University Foundation NHS Trust (SWFT) offers Physiotherapy and Occupational Therapy assessment and treatment to patients across three pathways:

- Urgent Therapy: covers acute deterioration leading to a high risk of falls, non-complex respiratory conditions, and urgent assessment of mobility, transfer, and equipment.
- Routine Therapy: manages housebound patients with chronic musculoskeletal and neurological conditions, including patients with reduced mobility and balance issues.
- Community Recovery Service (CRS): Enables patients to return home confidently post-discharge from the hospital.

Long waiting lists for appointments within the NHS have been an ongoing issue for some time, and it remains an essential aspect of service improvement (2). The NHS long term plan (3) aims to shift the model of care further upstream with a focus on preventive care, closer integration of services within the community for people with chronic conditions and reduce outpatient visits by a third. There are strong links between improved public health and reduced need to access healthcare and the NHS carbon footprint. This presents an opportunity to our physiotherapy service, to promote improved care and outcomes for patients, while minimising the environmental, social and financial costs of our care.

Specific Aims:

Our long-term aim is to reduce physiotherapy referrals from care homes by 35% through engaging care home residents in home exercise programmes. We anticipate several benefits including improved quality of life for residents, reduce waiting times for referrals, reduced carbon emissions associated with appointment travel as well as save money and staff time.

In the short term, we aim to

- identify reasons for referrals
- identify a suitable programme for care homes
- engage care home staff and residents
- Consider long term measurement and estimate benefits across the triple bottom line (social, environmental and financial).

Methods:

Studying the system and baseline data collection

Data analysis of the Routine Therapy waiting list revealed that 20% of referrals are from care homes in Stratford-Upon Avon and Warwick localities.

A review of referrals from care homes within Stratford-Upon-Avon and Warwick over three months (February – May 2023) detailing the number of and reasons for referrals, waiting times to first appointment, average number of appointments per patient, name and postcode of care home, average distance travelled by the physio team, and staff time attributed to travel to/from appointments. Most referrals were related to injury from falls and mobility issues.

Anecdotally, it was considered as the waiting list accumulated, other comorbidities emerged for some patients, including decreased functional mobility, and leading to additional appointments. This can negatively impact patients' psychological and physiological well-being (4).

Identifying change ideas

Falls prevention is vital to the success of this project. Based on our referral data, the average age of patients referred from care homes for Physiotherapy assessment is greater than 65, for which there is a 30% chance of falling (5), with approximately half the population of people older than 80.

To consider the most suitable interventions for preventing falls and need for physiotherapy referral related to falls in our care home patient population, the trust library staff supported us with a comprehensive literature review, finding the following

- A meta-analysis (6) identified research in which the risk of recurrent falls fell by 21% when individual and group interventions such as strength and resistance training, general physical activity, gait, balance, flexibility, and functional training were put in place for at least 20 – 75 mins, 3 – 5 times weekly, for about 3 – 8 months. Additionally, a 33% reduction in falls owing to multifactorial interventions such as assessment and advice on correction of orthostatic hypotension, medication review and recommendation to General Practitioner (GP), review of appropriateness of psychotropic drug use, optician referral, fluid or nutrition therapy, management of urinary incontinence, proper use and maintenance of walking aids, staff training, support, and feedback, furnishings and adaptations, including providing written materials, videos, lectures, and resident education.

- NICE (2013) guidelines (5) recommend strength and balance training are incorporated into exercise program, owing to its benefit for frequent fallers with balance and gait issues.
- According to a systematic review's (7) finding, exercise is effective in falls prevention with a highly significant effect when practiced 2 - 3 times weekly over six months. However, strength and balance training should be adequately combined to achieve this.
- there is little or no evidence showing efficacy for walking in minimizing falls (5).

We are in the process of developing a home exercise programme (HEP) that will target strength and balance training to improve static and dynamic sitting and standing balance to minimize the risks of falls.

Ideally initiatives would be person-centred, addressing patients' specific needs, including promoting social values (5). Individualised assessments for all residents would likely create additional work for the physiotherapy team and therefore to implement the programme, we will up-skill care home staff, increasing their confidence manual handling and in encouraging and supporting residents to practise the HEP. Inclusion criteria were developed to ensure a more generalised programme would be safe for all participants. The criteria include residents over 65 years old, who are cared for out of bed and able to maintain a seated upright position, who can follow simple commands with no unstable physical conditions and mild or no cognitive impairment.

Stakeholder engagement

The Programme Manager for the Aging Well program, Elaine Hodges, and the Warwickshire County Council Occupational Therapist in Quality Assurance, Jane Clark, welcomed the idea and are willing to support the project. One Physiotherapist was invited to an enhanced home and care home development plan meeting involving care home managers, where discussions took place regarding this project.

We received an average of 2.5 referrals per care home per month. Two care homes were selected (one per district council) for trial based on receiving a higher number of referrals from these homes (5 per month in Warwick, and 7 per month in Stratford). We met with the Managers of the selected care homes, who were pleased to participate in this project.

There are several options we can explore with care home staff, such as

- creating social exercise groups (seated weekly program)
- staff completing fall risk assessment and providing patient advice on fall prevention
- involve postural instability trainers living locally to support weekly sessions with residents in care homes
- encouraging care home staff to undertake more formal training such as the postural instability (FAME) and Otago programs, however these come with a cost.

Following agreement of the intervention and practicalities for this, our trial care home manager will receive comprehensive written information about the intervention's aims to disseminate to all staff, as demonstrated by Dyer et al, 2004 (8). In addition, participating care homes will receive training and information packs detailing the exercise programs and fall prevention strategies. The plan in the coming weeks is to attend one of the physical activity sessions held in the care home to observe, analyse and disseminate the ideas of this project. Following that, a structured plan would be drawn up in conjunction with the care home on how to incorporate these activities into the weekly itinerary of the residents.

Our long-term plan would aim to implement a similar prevention service across all interested care homes however two care homes were selected (one per district council) for trial based on receiving the most referrals

from these homes. We would aim to implement the programme remotely via virtual meetings as much as possible, empowering care home staff. When face to face meetings is required, we would aim to link these to a patient visit to maximise our savings as detailed below.

Measurement:

Patient outcomes:

The evidence base suggests similar programs run for at least six to twelve months, so we cannot measure patient outcomes for our cohort within the 10-week competition window. However, we plan to measure clinical impacts long term. Koskela et al. 2017 (9) state that it is unclear what outcome measures are most appropriate for assessing activity levels, health, and quality of life among older care home residents (with and without cognitive impairment). Instead, these researchers tested several measures for practicability and appropriateness for this population. Therefore, we have selected the Berg Balance Scale (BBS) (Appendix 1), Oxford muscle grading scale (OGS) (Appendix 2) and Falls Efficacy Scale (FES) (Appendix 3) assessments for before the intervention, at 6 months, and at 12 months to measure the clinical impact of this initiative. A reduction in referral numbers would also indicate improved patient outcomes. We have projected potential clinical impacts for care home residents based on the evidence base in our results section.

Environmental sustainability:

We calculated the miles driven by the physiotherapy team to each appointment for 3 months of referrals. Based on the evidence base, we have assumed that a 35% reduction in referrals is feasible within a 9-12 month time-frame. Once our average mileage was confirmed, we converted a 35% reduction into CO2e to estimate potential savings. We used the emission factor 0.3386 kgCO2e per mile driven in an average car of unknown fuel taken from the Government Greenhouse Gas reporting 2023 conversion factors dataset. This accounts for fuel and well to tank emissions.

Emission factors for PPE use were taken from Rizan et al 2021 (10).

Economic sustainability:

We have estimated financial savings in terms of physiotherapy time gained back from a 35% reduction in referrals. The costs of physiotherapist time were obtained from the 2022 costs for NHS and social healthcare, with the average cost of a one-to-one physiotherapy session of £144, and a group session at £92.

Social sustainability:

Patients and care home residents: The falls efficacy scale (Appendix 3) will be administered with patients before and after the 9-12 month programme. This would highlight any improvement or decline in confidence for activities of daily living (ADL).

Physiotherapy Staff: Average time to travel to and complete an appointment has been collected and we have estimated time gained back from a 35% reduction in referrals. It is not possible to measure social outcomes for this project within a 10-week project timeframe, however we plan to collect qualitative data via staff surveys on an ongoing basis and have detailed potential impacts in the results section.

Care home staff: A survey would be carried out at the beginning, at 6 months and 12 months, to assess the social impact of this project on care home staff (including managers), assisting us to identify needs and opinions of for change initiative and ensuring it is maintained. Additionally, this would highlight further benefits of this initiative to the care homes (e.g., reduced falls and costs relating to falls, reduced care hours per patient).

Results:

Patient outcomes:

There are projected potential clinical impacts for care home residents based on evidence-based studies, including improved overall wellbeing, reduced fall-related referrals, and improved quality of life. There is also potential for wider population benefit as change would be implemented across other care homes within Stratford-Upon-Avon and Warwick. A reduction in referrals may improve waiting times for other patients.

Environmental sustainability:

Table 1 shows a summary of average appointments per patient and staff travel data*

	Stratford	Warwick
Total number of referrals per month	13	17
Waiting time to first appointment (days)	21.33 (range 1-59)	18.04 (range 0-65)
Appointments per month - with primary physiotherapist - with second staff member attending (travelling separately)	 21.7 8	 55.6 24.3
Total journeys for physiotherapy team per month	29.7	79.9
Return distance per appointment per staff member (miles)	9.37 (range 1.8-23.6)	6.38 (range 1.4-18.4)
Total return miles travelled per month	278.3	509.8
35% reduction in total return miles driven per month	97.4	178.43
35% reduction in total miles driven per year	1,168.8	2,141.2
Carbon savings per year (kgCO2e)	395.8	725

*At time of calculations patients remained on the caseload (6 in Stratford and 14 in Warwick), so the number of appointments per patient may be underestimated. Some patients were excluded from calculations as they were awaiting their first appointment, or discharged unseen.

With a 35% reduction in appointments, we would reduce our miles driven by 3,318.4 miles per year, equivalent to 1,120.8 kgCO2e per year.

We will have an additional small saving from a reduction in PPE use. Assuming one pair of gloves and an apron are worn by each staff member for each appointment, with a total of 38.36 appointments reduced per month, this equates to a saving of approximately 2 kgCO2e per month in gloves and 2.5 kgCO2e in aprons, a potential saving of 54 kgCO2e per year.

Potential annual impact

With the programme implemented across all care homes and a 35% reduction in referrals achieved, we anticipate a saving of **1,175 kgCO2e per year**, equivalent to driving 3,470 miles in an average car. This saving may be overestimated as it does not consider travel required to implement our interventions.

We would aim to implement the programme remotely via virtual meetings as much as possible, empowering care home staff however a visit may be required to demonstrate and teach exercises. When face to face meetings are required, we would aim to link these to a patient visit to maximise our savings as detailed below.

Economic sustainability:
There is a projected reduction in cost of physiotherapy appointments to care homes due to referrals associated with falls.

Table 4 shows our time saved, assuming 90 minutes is required for each appointment (1 hour + 30 minutes travel) calculations:

	Stratford	Warwick
Number of appointments per month including double up	29.7	79.9
Time spent total (hrs)	44.5	119.8
Time saved with 35% reduction in appointments (hrs)	15.6	42

With a 35% reduction in appointments (38.36 appointments per month) the physiotherapy team would save 57.6 hours, or 7.7 days of staff time per month to dedicate to higher value activity. This may exclude time taken for receiving and triaging referrals, scheduling appointments, and any time dedicated to writing patient notes and programmes.

Based on a cost of £144 per one-to-one appointment, this equates to a saving of approximately £5,524 per month, or **£66,286 per year**. There would be an additional saving from the cost of fuel which has not been calculated.

These potential cost savings are likely overestimated as they do not account for physiotherapy team time to implement the intervention programme.

Social sustainability:
Care home staff: With a health improvement for patients, care home staff may save time as residents require less support and referrals. Seeing patients engage more in exercise and build confidence may improve staff wellbeing. With care home staff implementing HEP's there are potential positive or negative impacts – staff may enjoy learning, empowerment and taking on a new role/responsibility, or may feel this is a task added to add to already demanding workloads.

Physiotherapy staff:
As above, with a 35% reduction in appointments the physiotherapy team would save 57.6 hours, or 7.7 days of staff time per month to dedicate to higher value activity and implementing our preventative interventions. This reduction could increase the efficiency of the physiotherapy service more broadly.

Discussion:

Fall prevention programs, strength and balance training, and patient education are the bedrock of this project. Moving forward, empowerment and inclusion of care home staff will be critical to success and achieving projected savings as outlined in this report. With successful implementation in the two areas, we will reduce both environmental and financial costs associated with travel to and from care homes for physiotherapy sessions, hourly rates of physiotherapists' visit, as well as improving overall wellbeing for both staff and residents of care homes. We also anticipate these projections would reduce waiting times for other housebound patients awaiting physiotherapy input.

Potential barriers may include staff retention in care homes and the feasibility of expanding this initiative to other care homes in the selected areas. Co-development of programmes with care home staff will be essential

to address and aim to mitigate these barriers. Physiotherapists will carry out initial assessments, and review outcomes at 6 months and 12 months to measure the impact of the project.

A limitation to this project is that we have not calculated the time, financial costs and CO2e that will be attributed to our interventions. This has not been possible as we are still collaborating with care homes to identify the best way forward to ensure success of a preventative programme. As above, we would aim to implement the programme remotely via virtual meetings as much as possible, empowering care home staff. When face to face meetings is required, we would aim to link these to a patient visit to maximise our carbon and financial savings.

Conclusions:

This project aims to enhance residents' participation in physical activity, in turn improving their health, quality of life, and well-being through system-wide changes to care home organizational, environmental, and working practices. Although there are challenges associated with working in care homes, this project promises significant benefits and is affordable. With a growing number of elderly residents in residential care homes, this project is not only important for environmental sustainability, but financial, social, and clinical sustainability.

References and Resources

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Appendix 1: Berg Balance Scale

Berg Balance Scale (with instructions)

SITTING TO STANDING
INSTRUCTIONS: Please stand up. Try not to use your hand for support.
( ) 4 able to stand without using hands and stabilize independently
( ) 3 able to stand independently using hands
( ) 2 able to stand using hands after several tries
( ) 1 needs minimal aid to stand or stabilize
( ) 0 needs moderate or maximal assist to stand

STANDING UNSUPPORTED
INSTRUCTIONS: Please stand for two minutes without holding on.
( ) 4 able to stand safely for 2 minutes
( ) 3 able to stand 2 minutes with supervision
( ) 2 able to stand 30 seconds unsupported
( ) 1 needs several tries to stand 30 seconds unsupported
( ) 0 unable to stand 30 seconds unsupported

If a subject is able to stand 2 minutes unsupported, score full points for sitting unsupported. Proceed to item #4.

SITTING WITH BACK UNSUPPORTED BUT FEET SUPPORTED ON FLOOR OR ON A STOOL
INSTRUCTIONS: Please sit with arms folded for 2 minutes.
( ) 4 able to sit safely and securely for 2 minutes
( ) 3 able to sit 2 minutes under supervision
( ) 2 able to able to sit 30 seconds
( ) 1 able to sit 10 seconds
( ) 0 unable to sit without support 10 seconds

STANDING TO SITTING
INSTRUCTIONS: Please sit down.
( ) 4 sits safely with minimal use of hands
( ) 3 controls descent by using hands
( ) 2 uses back of legs against chair to control descent
( ) 1 sits independently but has uncontrolled descent
( ) 0 needs assist to sit

TRANSFERS
INSTRUCTIONS: Arrange chair(s) for pivot transfer. Ask subject to transfer one way toward a seat with armrests and one way toward a seat without armrests. You may use two chairs (one with and one without armrests) or a bed and a chair.
( ) 4 able to transfer safely with minor use of hands
( ) 3 able to transfer safely definite need of hands
( ) 2 able to transfer with verbal cuing and/or supervision
( ) 1 needs one person to assist
( ) 0 needs two people to assist or supervise to be safe

STANDING UNSUPPORTED WITH EYES CLOSED
INSTRUCTIONS: Please close your eyes and stand still for 10 seconds.
( ) 4 able to stand 10 seconds safely
( ) 3 able to stand 10 seconds with supervision
( ) 2 able to stand 3 seconds
( ) 1 unable to keep eyes closed 3 seconds but stays safely
( ) 0 needs help to keep from falling

STANDING UNSUPPORTED WITH FEET TOGETHER
INSTRUCTIONS: Place your feet together and stand without holding on.
( ) 4 able to place feet together independently and stand 1 minute safely
( ) 3 able to place feet together independently and stand 1 minute with supervision
( ) 2 able to place feet together independently but unable to hold for 30 seconds

Appendix 2: Muscle Strength Grading Scale

Muscle Strength Grading Scale

The Oxford Scale is a quick method of assessing and grading muscle power. A detailed knowledge of muscle anatomy is required to carry out an assessment appropriately. The Oxford Scale is a 0-5 scale which is then recorded as 0/5 or 2/5, sometimes with a + or - sign to indicate more or less power but not sufficient to reduce or increase the number. The physiotherapist should position the patient in the appropriate posture to allow accurate assessment and allow good vision and palpation of the appropriate structures.

Oxford Scale

0/5 No contraction

1/5 Visible/palpable muscle contraction but no movement

2/5 Movement with gravity eliminated

3/5 Movement against gravity only

4/5 Movement against gravity with some resistance

5/5 Movement against gravity with full resistance

Appendix 3: Falls efficacy scale

Falls Efficacy Scale

Name:_____ Date:_____

On a scale from 1 to 10, with 1 being very confident and 10 being not confident at all, how confident are you that you do the following activities without falling?

Activity:	**Score:** 1 = very confident 10 = not confident at all
Take a bath or shower	
Reach into cabinets or closets	
Walk around the house	
Prepare meals not requiring carrying heavy or hot objects	
Get in and out of bed	
Answer the door or telephone	
Get in and out of a chair	
Getting dressed and undressed	
Personal grooming (i.e. washing your face)	
Getting on and off of the toilet	
Total Score	

A total score of greater than 70 indicates that the person has a fear of falling

Adapted from Tinetti et al (1990)