The First 'True' Year of the Healthy and Active Rehabilitation Programme (HARP)

Evaluation from 1st November 2015 to 31st October 2016

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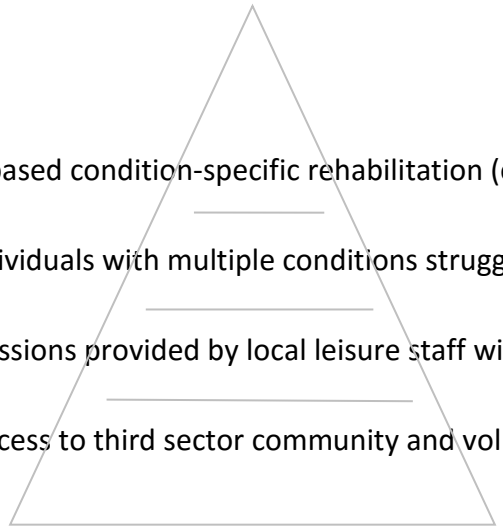
1. Background and Report Outline

1.1 Background

Many people with chronic disease have more than one chronic condition, which is referred to as multimorbidity[1]. The Healthy and Active Rehabilitation Programme (HARP) is a new model of rehabilitation for people living in Ayrshire with multimorbidity. The project was set up by a multi-agency health and social care team who worked collaboratively to produce a more sustainable, generic approach to rehabilitation. HARP targets deprived and rural communities across the region, providing rehabilitation to conditions that typically place high demands upon unscheduled care (cardiac or pulmonary disease, cancer, stroke, diabetes, and falls).

HARP was designed as a flexible four tiered model (**fig. 1**), with a focus upon supporting services users to develop the confidence and capabilities to self-manage their conditions in the longer term. Services users can move between its tiers in order to access the best support to suit their changing needs.

Figure 1: The Four Tiered HARP Model



A search of systematic reviews indicates that the breadth and depth of evidence for rehabilitation is varied across the diagnostic groups. Whilst beneficial physical and psychosocial outcomes obtained from cardiac[2,3], pulmonary[4] and cancer[5] rehabilitation programmes have been established, for stroke[6], diabetes[7] and falls[8] rehabilitation, research outcomes are varied though generally positive, but tend to be derived from smaller pools of trials, with very few interventions incorporating a structured programme of exercise and education. To date, there is no published evidence to support multimorbidity rehabilitation models like HARP, and only several studies trialling multidisciplinary educational interventions, with mixed, inconclusive results[1].

Prior to HARP, support for these conditions across Tiers One, Two and Four was varied and inconsistent, and the HARP team further developed and unified care provision within and across these tiers. Tier Three did not exist before HARP – thus this was an entirely new development, unique to HARP. To fully assess service users' needs and enable them to access the appropriate tier(s) within the model, new Tier Three HARP assessment clinics were set up across Ayrshire. Six new Tier Three, group exercise and education sessions were also established in: Kilbirnie and Ardrossan (North Ayrshire), Auchinleck and Kilmarnock (East Ayrshire), North Ayr and Girvan (South Ayrshire). Service users can access these for up to ten weeks.

Service provision is tailored to suit the needs of the different diagnostic groups, and to suit the population across different areas within Ayrshire; for example, in Ardrossan and Auchinleck, Tier Three exercise and education sessions were combined with Tier Four cardiac rehabilitation already offered in the area. By merging the resources and expertise of staff from Tiers Three and Four, in these geographical areas HARP is better able to meet the needs of a larger group of service users in a more streamlined way, whilst facilitating staff communication across the tiers. In a similar way, a combined Tier Two / Three class has been established in Kilbirnie. Much of the HARP input to those with a primary referring diagnosis of falls is delivered within Tier Two – leisure staff were already providing this service pre-HARP, and were considered best placed (in terms of their expertise, and the accessible community locations of the already established programme) to continue to deliver this HARP component. To date, there is no structured specialist rehabilitation service for cancer, stroke or diabetes – thus Tier Three provides rehabilitation to these groups, who would otherwise not have had access to this type of support.

1.2 Report Outline

The following report describes activity and outcomes for the first 'true' year of HARP – from 1st November 2015 (the point from which referral pathways and all HARP components were fully established) to 31st October 2016. An overall 'picture' of activity within the HARP model is presented, then, for each tier, where applicable, information is provided on developmental work, activity and outcomes, and on service improvement projects. Given that Tier Three was an entirely new innovation, a larger proportion of the evaluation focuses on this.

2.Overall Activity Within HARP

Fig. 2 provides a summary of HARP activity within the time period.

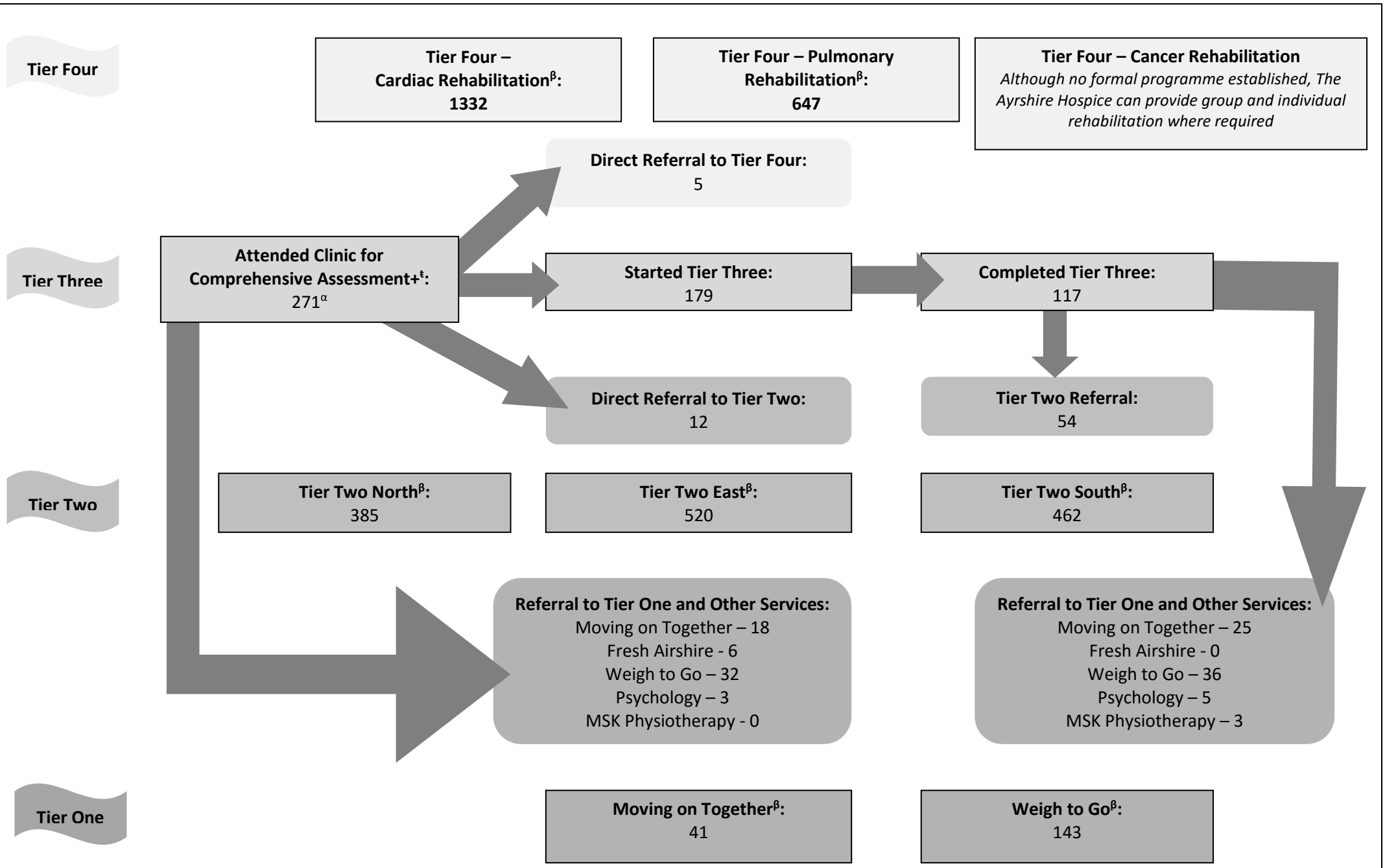


Figure 2: Overall Activity Within HARP *[α, 392 were referred to this appointment, 121 subsequently declined; β, data reflect total numbers of service users accessing programme component – including those referred via Tier Three and via other tiers and referrers; ŧ, comprehensive assessment plus progression onto tier three programme and / or other referrals as requested by service user]*

3. Tier One

Across Ayrshire, HARP has sought to work co-productively with the third sector and service users, to develop an innovative and sustainable approach to health that exceeds the confines of traditional health and social care models. Within the time period, a number of projects and collaborations were initiated.

3.1 Activity Friends – A Role within Rehabilitation

Aim: The aim of this project was to scope, develop and implement at least ten volunteers (‘*activity friends’*) within specialist and multimorbidity rehabilitation, in a way which supports volunteers’ health and wellbeing.

Methods: This project had eight steps: 1 – develop role descriptor in line with principles of person centred care, 2- benchmark with other local / national services incorporating volunteers, 3 – test ‘activity friend’ role in three programmes, 4 – recruit volunteers, 5 – secure funding for travel and uniforms, 6 – deliver volunteer training events, 7 – complete full recruitment process, 8 – volunteers take up roles as ‘*activity friends’* across all of HARP.

Results: There are now 20 ‘*activity friends’* supporting specialist and multimorbidity rehabilitation in Ayrshire. The cost is only approx £15 per volunteer for uniforms and name badges (only a minority claim travel), however the process is time consuming in the short-term (60 minutes per volunteer, plus training / planning – not costed). ‘*Activity friend’* feedback is entirely positive – *“It gets me up, despite the weather”, “Being a volunteer has reinforced my efforts and thinking”* [regarding an active lifestyle], *“My wife says I’m now less crabbit.”*

Conclusions: Although there were challenges, the process involved in implementing ‘*activity friends’* within rehabilitation has been extremely worthwhile, and has supported the health and wellbeing of those volunteers.

The HARP Activity Friends project was selected as a ‘Celebrating Success’ presentation to NHS Ayrshire & Arran’s, CEO, John Burns.*

3.2 Weigh to Go

The Weigh to Go (WTG) weight management programme has been running within Ayrshire for several years. Created and delivered by health and socia care staff, both in hospital and in the community, WTG is offered to those with a body mass index of more than 25. One important aim for WTG attendees is to achieve 5% weight loss. At this clinically important level, weight loss can prevent type II diabetes mellitus, and is associated with improved systolic and diastolic blood pressure, and cholesterol[9].

Prior to HARP, WTG was provided within Tier One and Two (in the community) and Tier Four (cardiac rehabilitation). With the development of HARP, the 'branch' of WTG that was previously available to cardiac rehabilitation attendees was expanded to include those attending Tier Three. With this expansion, capacity within this new 'Tier Three / Tier Four branch' almost trebled, whilst outcomes were maintained. In the year prior to HARP, 53 new WTG attendees were seen by the team, with 19 (36%) achieving the 5% weight loss target by the end of the programme, whilst in the first year of HARP, 143 new WTG attendees were seen by the team, with 45 (37%) achieving the 5% weight loss target.

3.3 Moving on Together

The Moving on Together (MoT) programme promotes self-management and empowerment to manage chronic conditions by teaching self-management techniques (goal setting, problem solving, the benefits of healthy eating and physical activity, relaxation, managing symptoms, and medication compliance). MoT has been delivered within NHS Ayrshire and Arran, within cardiac and pulmonary rehabilitation for the past seven years. With the creation of HARP, cardiac and pulmonary staff and lay facilitators delivering MoT have come together to merge and expand the service to allow service users to access from any tier of the programme.

Within the time period, six MoT courses were run across Ayrshire, attended by 41 service users. At the end of the programme they were asked to tick all of the potential benefits from this list that they felt they had gained (% agreement of 39 who completed the programme):

- ✓ *I now take an active role in managing my long-term condition (83%)*
- ✓ *I now know how to get information that will help me manage my long-term condition (85%)*
- ✓ *I now know how to get as much as I can from my health appointments (88%)*
- ✓ *I now have improved self-confidence (78%*
- ✓ *I have made changes to my lifestyle (83%)*
- ✓ *I now have a positive attitude to life (78%)*
- ✓ *I have met and learned from others living with a long-term condition (93%)*

For these 41 service users (39 who completed the programme), **figs. 3a** and **3b** show how MoT impacted upon the extent to which service users' conditions affect various aspects of their lives: home tasks, relationships, socialising and hobbies, work, and their future outlook. For all of these outcomes the numbers of service users (labelled on the graphs) who reported that their conditions had 'no impact' or impacted only 'sometimes' increased after completion of MoT.

Figure 3a: Does Your Condition Affect.....?

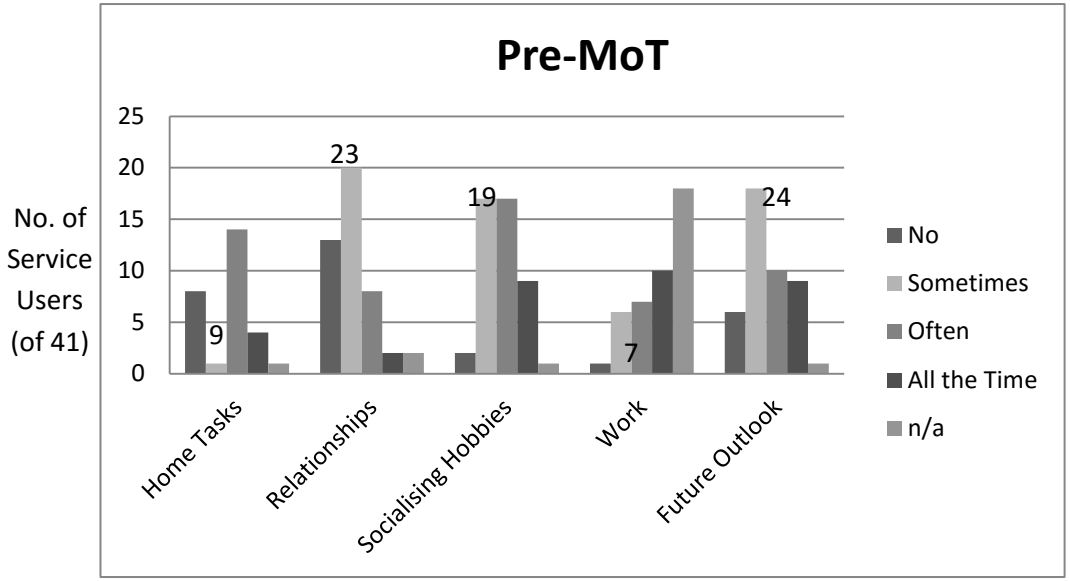
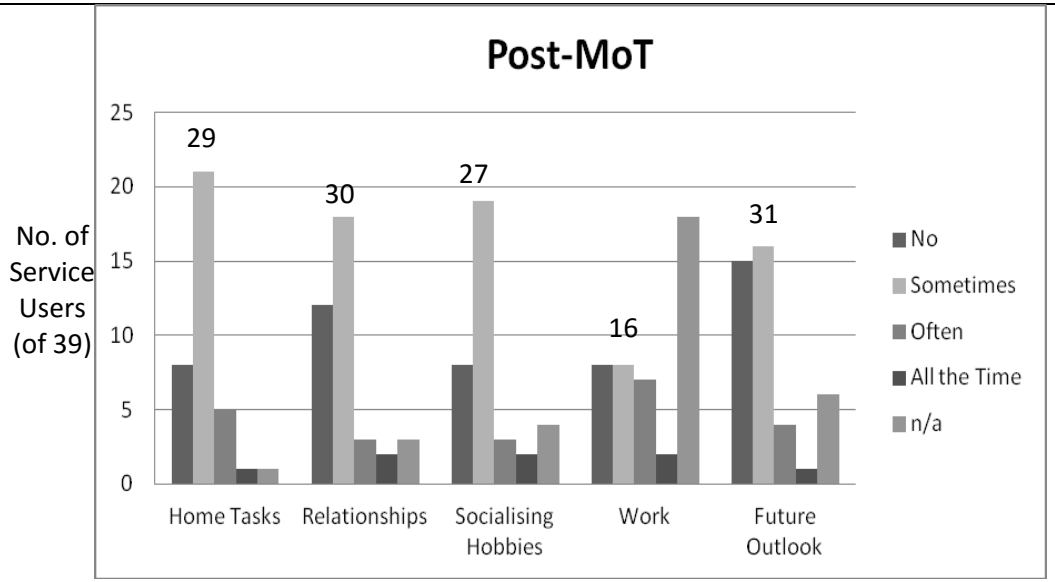


Figure 3b: Does Your Condition Affect....?



3.4 Walking Football Pilot

A pilot of walking football for 16 Tier Three and Tier Four cardiac rehabilitation service users was held at Ayrshire College and run by its students. NHS staff from HARP and *Activity Friends* also attended. None of the service users, staff or volunteers had tried walking football before, and feedback was very positive:

Service Users - *"A good way to exercise and participate in a team"* *"Interactive.....exercise without thinking about it"*
Students - *"Wonderful experience to work with key client groups with health problems, real life experience"*
Tier Three / Four Staff – *"Mixing with our patients on an even playing ground was so much fun"* *"If exercise is always this enjoyable people will keep it up"*

The pilot highlighted the need to provide education in order to ensure that this activity may be offered and applied safely across a variety of multimorbidities. Subsequently, he HARP team have been working with those delivering walking football across Ayrshire – sharing knowledge and skills relating to exercise and the clinical features of various long-term conditions. Both 'Heartstart' (who deliver Ayrshire-wide layman training on CPR) and Ayrshire College are collaborating with this initiative, ensuring that HARP is making the most of Ayrshire's community assets for the benefit of service users.

3.5 Partnership Working

Nationally, HARP linked with many organisations to promote its values and its future as a sustainable model. These links include: House of Care, The Alliance, Macmillan, Chest Heart and Stroke Scotland (CHSS), the British Association of Cardiovascular and Pulmonary Rehabilitation (BACPR) and Age Scotland.

From the outset of the project, the HARP team established links with many individuals and organisations across Ayrshire. The support provided by Voluntary Action South Ayrshire (VASA) in South Ayrshire, the Council of Voluntary Organisation (CVO) in East Ayrshire and Arran Community and Voluntary Service (CVS) in North Ayrshire has been invaluable – providing many contacts that can link service users to volunteering / befriending / garden and Green Space projects in their local areas. HARP has also worked with Tesco in Auchinleck to deliver health information in partnership with the Community Health Improvement Partnership (CHIP), the Lifestyle Exercise and Nutrition (LEAN) programme, and the diabetes specialist nurse team.

3.6 Inclusive Training for All Stakeholders

Given the wide inclusion criteria for HARP, there was the recognition that the programme's stakeholders would be likely to encounter a much wider range of long-term conditions than they did previously. On an ongoing basis, but especially within the first year of HARP, the team organised many structured training and informal learning opportunities available to the many allied health professional groups, leisure employees, fitness instructors, specialist nurses and third sector groups involved in delivering the programme. With the recognition that, across all of the primary diagnostic groups, persistent pain can hinder HARP attendance and has the potential to diminish positive outcomes from the programme, knowledge and understanding of chronic pain management has been identified as a priority learning need for all stakeholders.

4. Tier Two

During this time period, leisure services across all three partnerships worked hard to develop and promote Tier Two.

4.1 North Ayrshire

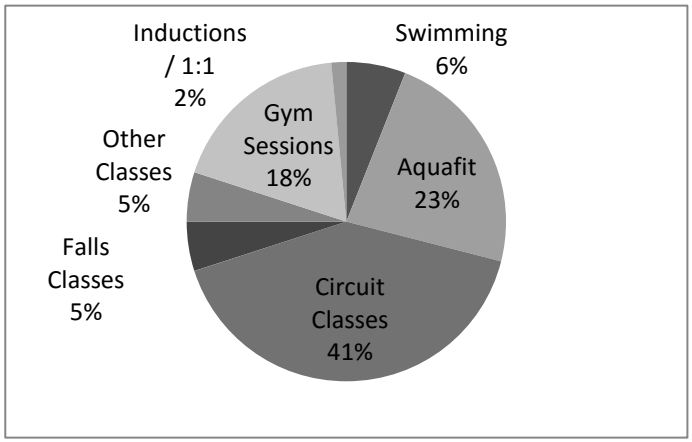
During the time period, the North Ayrshire leisure team spent time establishing the exercise referral route and pathways to enable service users to access Tier Two. New classes set up included: those specific to falls prevention, those specific to pulmonary disease, aquafit, pilates, keep fit, personalised gym programmes and gym classes. The Active North Ayrshire database was set up to capture data from point of referral and subsequent follow-up to monitor any changes. Collaborative working with Tier Three was introduced, with leisure staff attending Tier Three classes in Ardrossan and Kilbirnie, to enable smooth transition from Tier Three to Two.

As part of the Continued Professional Development programme, training took place to enhance the skills of the team to allow effective delivery of stroke specific classes and gym sessions. The course was developed in partnership with NHS Ayrshire and Arran as a result of a needs assessment of the delivery competencies within the HARP programme. In addition to this two members of the team and completed Level 3 Wright Foundation Exercise Referral Course and four Level 4 Diabetes / Obesity Training.

A total of 385 referrals into North Ayrshire's Tier Two were made during the time period*, and there were 16,233 attendances at exercise sessions. The proportions of attendances at different types of session are shown in **fig. 4**.

*[*this includes direct referrals into Tier Two, and referrals made from other Tiers, and includes general HARP referrals and specialist falls referrals]*

Figure 4: Breakdown of Types of Sessions Attended (of 16,233 Attendances)



4.2 East Ayrshire

In the first few months, leisure staff began to collaborate and establish links with Tier Three staff, and met to discuss and establish the structure, venue and equipment required for new Tier Two assessments and exercise sessions across the area. The team constantly reviewed the new developments and worked hard to overcome challenges that they identified - they found that assessments required more time than first anticipated due to the complexity of service users' multimorbidities, existing classes required modification for those referred with pulmonary disease, and there was the need for a more intensive class to suit those with poor mobility following stroke.

Priorities within the team during this time were around recruiting new staff and identifying their immediate training needs. Four team members completed the Level 3 Wright Foundation Exercise Referral Course, one started a Level 4 qualification in Stroke and Neurological Conditions, three completed Level 4 Diabetes / Obesity Training, and two completed the Yoga Nidra Instructor Award (one furthered this with Acro Yoga).

In response to a national media campaign highlighting the impact of social isolation, particularly in older adults with multiple morbidities, the team decided to particularly focus on developing the social aspect of the sessions. Furthermore, as the beneficial effects of yoga have been demonstrated across a variety of mental health and physical conditions, yoga classes were successfully introduced as an option for service users, whilst a HARP walk was introduced as an alternative to traditional exercise classes. New classes in Patna and Newmilns were introduced to support those referred with multimorbidity within that area.

A total of 520 referrals into East Ayrshire's Tier Two were made during the time period*.

*[*this includes direct referrals into Tier Two, and referrals made from other Tiers, and includes general HARP referrals and specialist falls referrals]*

4.3 South Ayrshire

Two new HARP classes were started at Girvan (South Parish Church), and two were started at Ayr (Citadel). The Tier Two initial assessment process was fully established and offered to all new service users. Links and pathways were fully developed to enable HARP service users to access numerous activities within the South Ayrshire Councils Health Programme, including supervised gym and swimming sessions, aquafit, tai chi, yoga and pilates. The pre-existing South Ayrshire Leisure database was updated to capture all HARP data.

Staff learning needs for HARP were identified, and training was organised on falls, diabetes, lymphodema and obesity. Many staff attended area-wide HARP training days organised by the HARP project team, and three staff members completed British Association of Cardiovascular Prevention and Rehabilitation (BACPR) training.

Leisure staff worked closely with health and social care colleagues to promote Tier Two to service users attending Tier Three and Tier Four exercise and education classes, and to a wider range of stakeholders via:

- Voluntary Action South Ayrshire (VASA)
- Barns Medical Practice, Ayr – Patient Participation Group
- OIR Troon and Maybole
- Age Scotland – Girvan
- 'Supporting You to Live your Life' your way event – Ayr Town Hall
- Communities Event – South Ayrshire

A total of 462 referrals into South Ayrshire's Tier Two were made during the time period*.

*[*this includes direct referrals into Tier Two, and referrals made from other Tiers, and includes general HARP referrals and specialist falls referrals]*

5. Tier Three

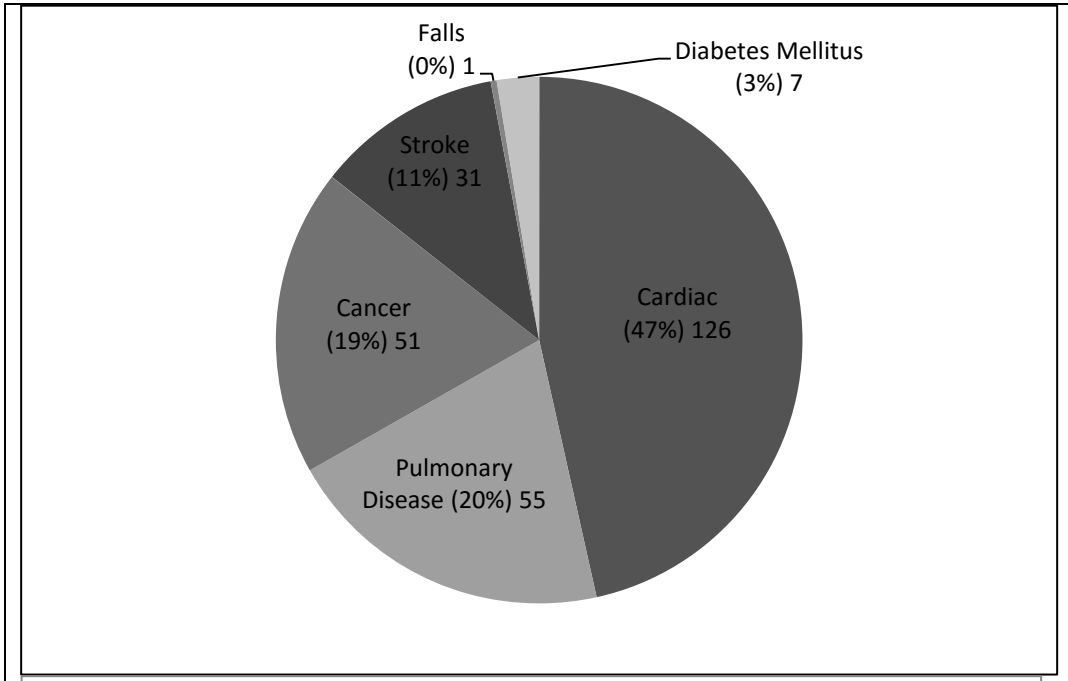
5.1 Baseline Data for Those Who Attended for Comprehensive Assessment+

Data are presented for the 271 service users who attended clinic for a comprehensive assessment of their needs (plus progression into Tier Three exercise and education sessions and / or referral to other services). Of the 271, 93 (34%) were referred from East Ayrshire, 100 (37%) were referred from North Ayrshire, and 78 (29%) were referred from South Ayrshire.

Clinic attendees had a mean age 65.6 years (range 41-92 years) and 128 (47%) of them were male and 143 (53%) were female. As shown in **fig. 5**, most of the population were referred with a primary cardiac diagnosis, and very few had a primary diagnosis of diabetes mellitus or falls. **Fig. 6** demonstrates that, in addition to their primary referring diagnosis, most attendees had one or two other medical conditions. The average number of additional medical conditions for the population was two (i.e. three in total).

Figure 5: Primary Referring Diagnoses at Clinic

Figure 6: Numbers of Additional Medical Conditions of Clinic Attendees



(26%)

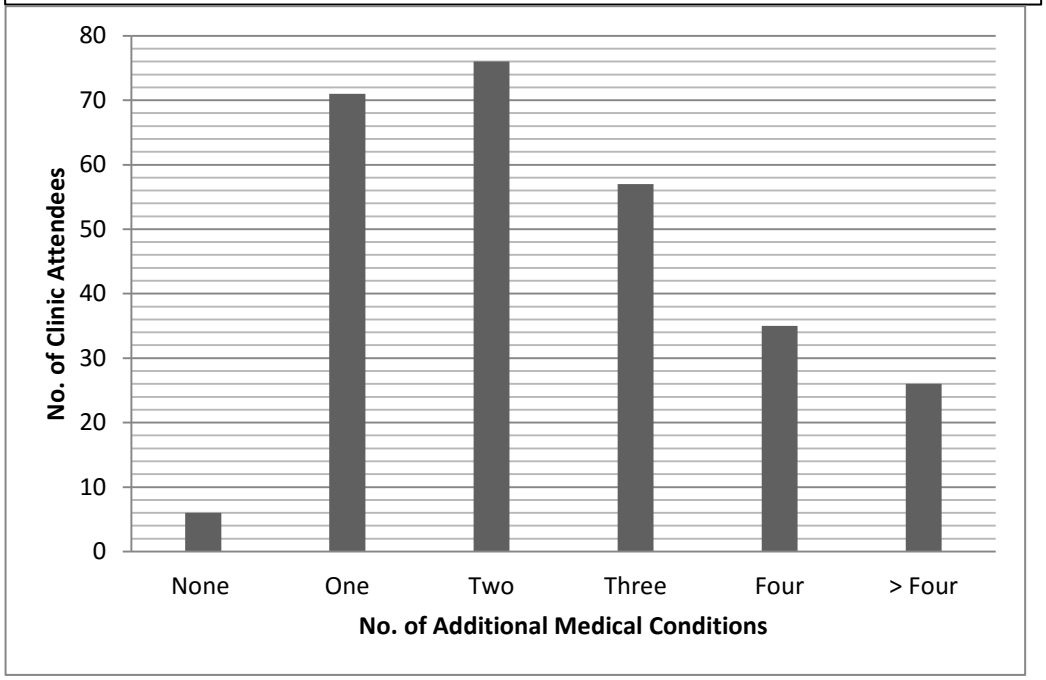
(28%)

(21%)

(13%)

(10%)

(2%)



5.2 Demographics of Those Who Completed Tier Three

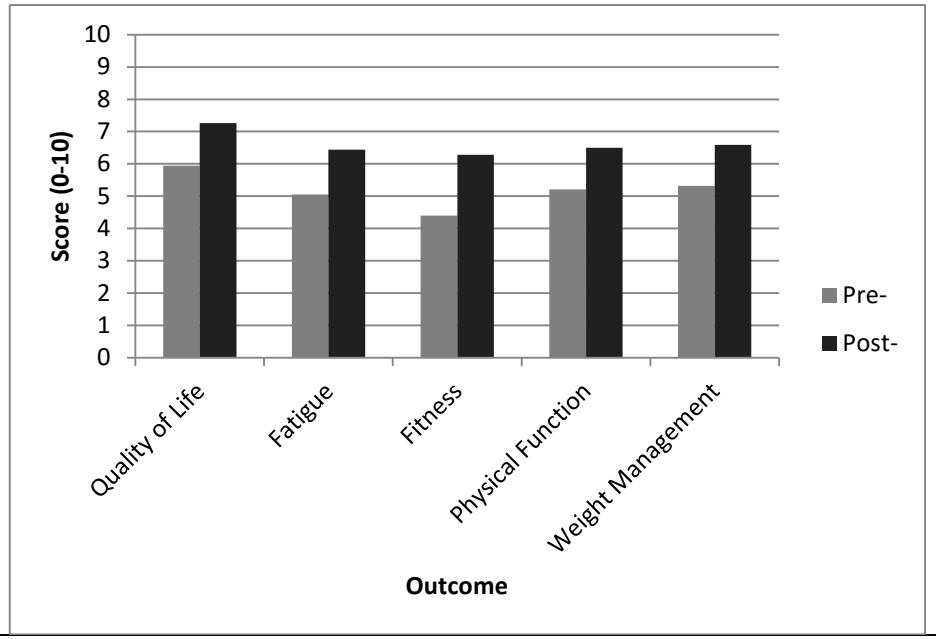
Demographics of those who completed Tier Three are very similar to data from the baseline HARP group who attended clinic for comprehensive assessment+. Mean age of the 117 who completed Tier Three was 66.5 years (range 43 to 92 years). 56 (48%) were male, and 61(52%) were female. 41 (35%) were from within East Ayrshire, 30 (26%) from North, and 46 (39%) from South. Primary referring diagnoses of those who completed were: cardiac – 46 (39%), pulmonary disease – 23 (20%), cancer – 26 (22%), stroke – 19 (16%), falls – 0, diabetes mellitus – 2 (1%). Most had two or three additional medical conditions and the average number of additional conditions was two (i.e. three in total).

5.3 Quantitative Outcomes

5.3.1 Visual Analogue Scale

Pre- and post- Tier Three, service users are asked to complete visual analogue scales on their perceptions of their own: quality of life, fatigue, fitness, physical function and weight management (0= worst state imaginable, 10=best state possible). As shown in **fig. 7**, upon completion of Tier Three, scores consistently improved by 20-30% across all outcomes.

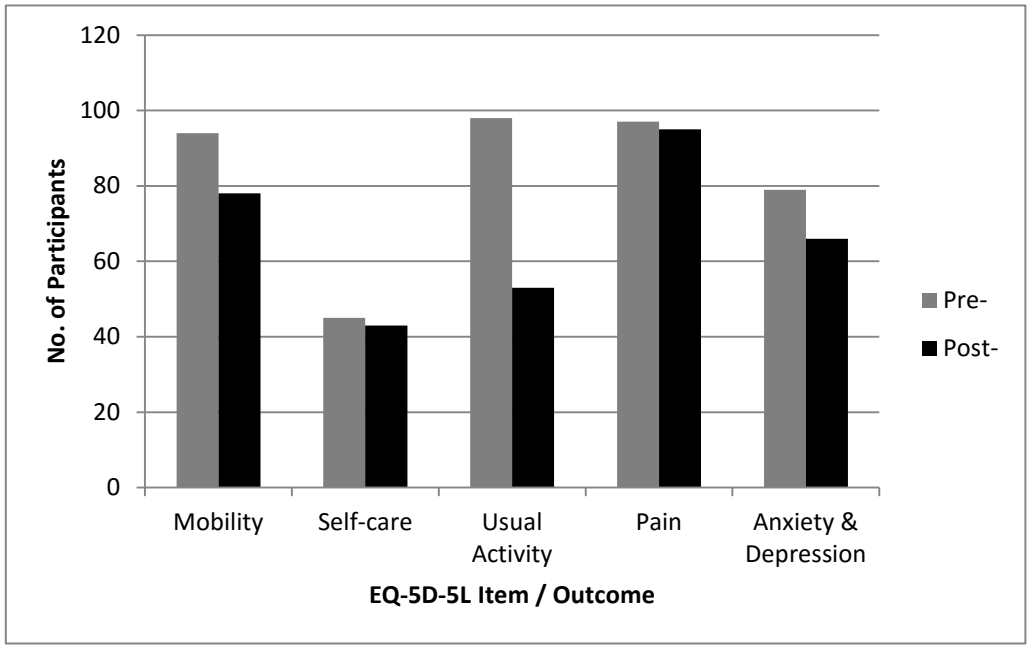
Figure 7: Visual Analogue Scale Data Pre- and Post- Tier Three



5.3.2 EQ-5D-5L

The EQ-5D-5L questionnaire asks respondents to indicate whether they have problems with mobility, self-care, usual activity, pain or anxiety / depression. For each outcome, responses are given as: 'no problem', 'slight problem', 'moderate problem', 'severe problem', or 'unable to perform'. Of the 117 who completed Tier Three, **fig. 8** shows the numbers of those who stated that they had a problem with these outcomes (i.e. those who did not respond with 'no problem') pre- and post-Tier Three. Upon completing Tier Three, numbers of those reporting problems had reduced across all of these outcomes – and substantially in relation to mobility, usual activity and anxiety / depression. The EQ-5D-5L also asks respondents to score their health status out of 100 (100 = best health imaginable, 0 = worst health imaginable). The mean health status score pre- Tier Three was 57.5, and upon completion of Tier Three was 70.23 (19% improvement).

Figure 8: Service Users Reporting Problems in EQ-5D-5L Outcomes Pre- and Post Tier Three



5.3.3 Cardiovascular Risk Factors

Table 1 shows numbers of Tier Three attendees who presented for comprehensive assessment+ with documented cardiovascular risk factor data which was outwith nationally agreed targets. Of these service users, the numbers and percentages of those who had either achieved or improved towards the targets upon completion of the programme are presented.

Table 1: Service Users Improving Towards / Achieving Cardiovascular Risk Factor Targets Upon Tier Three Completion

*[*Data are presented as numbers of 117 who completed Tier Three; [α]data are presented as numbers (%) of those with data outwith targets; m, male; f, female; CPD, cigarettes per day; [β], waist circumference targets for Asian populations: <80cm f / <90cm m)]*

Risk Factor (Target)	Baseline Data Outwith Target* - no.	Improved Towards / Achieved Target[α] – no. (%)
Smoking (0 CPD)	7	3 (43%)
Blood Pressure (145/85mmHg)	38	30 (79%)
Cholesterol (<5mmol)	14	5 (36%)
Body Mass Index (<25)	84	27 (32%)
Waist Circumference (<88cm f / <102cm m[β])	75	28 (37%)
Alcohol Intake (14u/wk)	1	0 (0%)
Physical Activity (150min/wk)	69	54 (78%)

Very few attendees had recorded baseline data outwith national targets in relation to smoking, cholesterol or alcohol. Across the group, Tier Three impacted most positively upon blood pressure and physical activity level. By supporting service users to reduce their blood pressure to within the target, HARP helped reduce their risk of developing cardiovascular and kidney disease, and their risk of death from cardiovascular disease and stroke (both of which increase linearly with increasing blood pressure from just below target level)[10]. Similarly, supporting them to work towards meeting the physical activity target will have postively impacted upon their blood pressure and cholesterol, and risk of developing type II diabetes[11].

Prevalences of those with body mass index and waist circumference outwith recommended targets were similar, and percentages of those improving towards / achieving the target were similar to that observed within WTG (~35%). For weight management related outcomes, it is often difficult to observe improvement within a relatively short (10-week) time period. Certainly, across all of these data, it is likely that there was variation in terms of which 'unhealthy behaviours' / cardiovascular risk factors service users prioritised to address. Future analyses could examine the interaction between improvements addressed / achieved (e.g. does meeting the physical activity recommendation increase likelihood of reducing body mass index or blood pressure?).

5.4 Qualitative Outcomes

5.4.1 Focus Groups

To engage HARP service users to ascertain their perceptions of Tier Three and its impact upon their abilities to self-manage, four focus groups were held. Each group consisted of 6-9 HARP attendees (total = 28 across all four groups). The mean age of these 28 service users was 66 years (range 55-76 years), and there were 23 males and six females. Primary referring diagnoses were: cardiac – 19, pulmonary – 1, cancer – 3, stroke – 4, falls – 0, diabetes mellitus – 1.

Within the groups, the main question to be answered was: *What are your thoughts and experiences about attending HARP and what impact has the programme had upon how able you feel to self-manage your condition?* Around this were open questions about previous exercise / health education experience, expectations of HARP, barriers and facilitators of attendance, and perceptions of any longer term impact of attending HARP. Data evolved around three key themes: changing perceptions, changing behaviour and support (**table 2**).

Table 2: Key Themes and Sub-Themes From Tier Three Focus Groups

Key Theme	Sub-Themes	Examples of Verbatim Comments
Changing Perceptions	**Physical Capabilities**	*"You see the main thing is that it [HARP] lets you know what you're capable of, and what your limits are"* *"... I wasn't sure what I was coming to, and I had this thinking that there might be big expectations of me to work hard"*
	Confidence	*"The confidence comes from being able to realise that you can still do things"* *"When they [the family] have confidence that you can do things, it means you do more together, or actually even means they're more likely to leave you alone to do what you want to do"*
	Control	*[After a diagnosis] "One of the things you notice is loss of control...life is over. But actually it's not....this [HARP] is something you can do to get control back."*
Changing Behaviour	**Motivation**	*"Not knowing where to start, I was never motivated to get off my chair"* *"Now that I know what I can do, my goal is to try to get fit enough to cycle again"*
	Adopting 'Healthy' Behaviours	*"It's such a motivating experience. It has a knock-on effect on all different parts of your life, making you healthy."*
Support	**Staff**	*"... These medical people are being so encouraging to me, and trying to help me, so I should help myself"* *"The confidence comes from having the staff there while you try things that you wouldn't be sure about doing at home."*
	Peer	*"....that first week, you don't know anybody....but then a couple of weeks and you're just part of the crowd"*

"It's good to see people in the same class with the same or different problems. It makes you feel better to be with them, whether they're fitter than you or less fit."

Focus groups suggested that service users perceived HARP to be useful in making them aware of their physical capabilities, with an associated growth in confidence, increased physical activity level and better control over their condition(s). Benefits extended throughout the family, with less family worry and dependence and more opportunity for socialising. With an awareness of capabilities, goals were able to be set, reinforcing motivation for physical activity and generating motivation for developing other 'healthy' behaviours. Staff support and enthusiasm alleviated pre-participation apprehension about the physical demands of HARP exercise, and encouraged service users to start the programme and take control of their condition(s). Initial trepidation about joining the peer group dissipated as service users gained confidence, motivation, support and social interaction from their class mates. Although service users placed little emphasis upon whether class mates had the same or different problems to themselves, some of the cardiac participants vocalised heightened educational and support needs which staff must remain aware of to help enable them to develop confidence and competence for independent self-management in the long term.

5.4.2 Extracts From A Patient Story – Nicky

Nicky has made a number of changes to her lifestyle since beginning HARP, and she has taken control of the aspects of her life which are important to her. Her journey has not been easy but she has managed to stay focused and she has said that her new self-management approach has helped her to cope. In turn, this has stopped her from being overwhelmed by challenges, and she has managed to stay on track and reach her goals:

When asked about her ability to self-manage as a result of HARP, Nicky said:

"I would say that I am better at it now. Much, much better at it now. I think in the past I've maybe just let things go along a wee bit and I think I've now realised you need to take responsibility for yourself, and move forward, and do things yourself... There are a lot of opportunities out there and I kind of feel that now I go looking for more opportunities than I did before. Before I was kind of a bit pathetic and a bit nervous and quite a fraidy cat basically. And I think now I'm not; I'm quite brave now... I think I'm very much more aware... I suppose like a lot of people that have been through cancer treatment. I'm very much aware of my own mortality, realising that anything can change... now it's like I'm a totally different person. I'm a lot more realistic and a lot more in the moment I think now. And if I want something I know I need to sort myself out and go and get it."

She also said:

"I can't say enough how much it has lived up to my expectations. It was wonderful, absolutely wonderful! It's been so much fun... the girls are amazing. I think what they do, they make... I felt completely safe. And just... comfortable. They were friendly, they were kind. They were clearly keeping an eye on us all. From the first week there was a wee lady Rose, who came out and greeted me and took me in. It was only her second week. But she still made an effort to come out and great me and take me in 'cause she could see that I was a bit worried, and she was lovely... we hardly ever talk about illness, it's more, you know what everybody's been up to during the week... Folk just chat and you feel just like a normal person and I love that. And as far as the exercise is concerned I feel amazing! That I'm achieving something and it inspires me to do more myself. Like going out for walks with the dogs, I make an effort to walk faster... getting my heart rate up... Now that I know what I should be doing from the class it's kinda shoving me in the right direction. And I like that."

"I want to find the right words... Just saying wonderful or brilliant seems a bit throw-away... I would say life-enhancing. For me certainly. Definitely life-enhancing. It's made a huge, huge difference to me... That sums it up... Yeah, definitely life-enhancing! Wonderful....Life-changing, almost."

"I think HARP is the best, couldn't do without it! I love it!"

5.4.3 Feedback from Fifteen Tier Three Participants in Kilbirnie

What has been the impact of HARP on you?

"Encouraged to move more" "Given me confidence" "I can rise from a chair" "I play badminton with my wife again" "I now feel normal"
"I returned to work earlier and with more confidence" "I've stopped using my walking stick" "I am aware of my posture"
"I couldn't breathe but I am walking now, I didn't before classes" "It has disciplined me and motivated me to exercise"

Have other people noticed a difference?

"My family say I'm walking more and noticed my increase in energy" "Being ill has made me look better- I look after myself and eat better now"
"I now help about the house" "My husband said my mood is better" "It hasn't made any difference, I am just too sore"
"People have noticed I have lost weight" "My walking is stronger, I now step out"

If you hadn't had HARP - what would have happened?

***"**I would have sat in a chair all day waiting for Corrie" **"**I couldn't be bothered to do anything" **"**I felt sorry for myself"*
"I lay in bed reading a book, all the time" "Too apprehensive to do anything"

Group thoughts?

"Everyone is happier" "We make links with each other" "We reassure each other" "We look out for people on their first day to make them feel better"
"HARP allowed me to meet new people" "[having the] The Kilbirnie location is important – we wouldn't have travelled"

HARP one word summary?

"Confidence" "Motivating" "Encouraging" "Different" "Better"

5.5 Economic Analysis – Quality-Adjusted Life Years from EQ-5D-5L

NHS Ayrshire and Arran's health economics department conducted an analysis which examined EQ-5D-5L outcomes from the 117 service users who completed Tier Three during the time period, against the cost of providing this service.

5.5.1 Costs

The total annual cost of delivering HARP is £168,000. From 1st November 2015, to 31st October 2016, 271 service users attended the initial HARP comprehensive assessment+ (271 x 1 session pp) and 117 of those completed Tier Three (117 x 10 sessions pp). This gives a total of 1431 sessions during the year at a cost of £117.40 per session (£168,000/1431), and a cost of £1291.40 pp for those who completed Tier Three (£117.4 x 11). Though much of HARP's funding has centred around Tier Three, the analysis does not account for monies apportioned to other tiers. Further, whilst the cost of providing HARP is unlikely to change, as the throughput of service users increases, the cost per service user should decrease.

5.5.2 EQ-5D-5L Data

EQ-5D-5L data was obtained at two time points from the 117 service users who completed Tier Three: at initial comprehensive assessment+, and upon completion of the programme (i.e. pre- and post-). EQ-5D-5L data are used alongside UK-base value sets to calculate a health index between 0 and 1 for each set of responses to the questionnaire. A score of 1 is considered to represent perfect health and 0 to represent death. Health state values allow calculation of QALYs (quality-adjusted life years). Amongst the 116 who completed Tier Three, the average QALY gain upon completion of the programme was 0.044, however the 95% confidence intervals for this value were wide [0.016, 0.073] .

5.5.3 Incremental Cost-Effectiveness Ratio (ICER)

From this information, an ICER can be calculated: Cost per QALY = cost per service user / average QALY gain = £1291.40 / 0.044 = £29,350

Applying a cost-effectiveness threshold of £30,000 to an ICER suggests that this service is cost-effective (below the threshold), however there is uncertainty due to the wide ranging 95% confidence intervals. The variation is due to heterogeneity within the population, which may be expected from a group with a diverse range of multimorbidities.

5.5.4 Conclusions and Future Analyses

From these data appears cost-effective, however its impact upon QALYs varies widely, and results should therefore be considered cautiously. This analysis will be repeated in future, when throughput of service users is likely to be higher and cost per service user lower. Additionally, data will be collected from service users who attend for comprehensive assessment+ but choose not to complete Tier Three – providing sub-groups of data, for comparison.

5.6 Impact Upon Healthcare Usage (Unscheduled Care)

For the time period, data were collected from three age and sex-matched groups: those who completed the full programme of Tier Three exercise/education sessions ('Full HARP'), those who attended the initial comprehensive assessment+ and declined Tier Three exercise/education sessions ('Assessment+'), and those who chose not to attend ('Declined All'),. There were 90 service users in each group (n=270 in total). For all 270 service users, NHS Ayrshire and Arran's Business Intelligence department collated hospital admission data across all specialities for for the six months preceding, and the six months following, referral to HARP.

5.6.1 Characteristics of Examined Groups

Table 3 shows characteristics of the three groups, which are representative of the typical HARP population. There were no significant differences between the groups for these data.

Table 3: Unscheduled Care Group Characteristics

Group	Age*		Gender*	No. of Co-existing Morbidities$^{\alpha}$	
	Mean	Range		Mean	Range
Full HARP	64.13	43-88	38 m / 52 f	3.35	0-6
Assessment+	64.19	41-87	43 m / 47 f	3.3	0-8
Declined All	63.93	39-87	38 m / 52 f	nk	nk

m, male; f, female; *, no significant difference in data between groups as tested using one-way ANOVA ($p>0.05$);
$^{\alpha}$, no significant difference in data between groups as tested using 2-sample t-test ($p>0.05$)

5.6.2 Total Number of Admissions, Number of Service Users Admitted and Total Bed Days Accrued (Table 4)

For total numbers of admissions accrued, between the three groups there were no significant differences either in the six months preceding referral to HARP, or in the six months following. These statistical analyses are surprising, as the numbers of admissions accrued for the 'Assessment+' group were considerably higher than for the other two groups during both two time periods. For all three groups, the total number of admissions reduced significantly post-HARP, and the number of service users admitted (of the 90 within each group) also reduced.

For total bed days, the 'Declined All' group accrued more than the other two groups, both pre- and post- referral to HARP. On first analysis, the 'Assessment+' groups exhibited a statistically significant reduction in bed days, whilst the other two groups displayed an increase. However, further examination revealed that, in the six months after HARP referral, total bed days accrued by the 'Full HARP' group were skewed by one service user who accrued 167 days. Excluding this individual from analysis resulted in a statistically significant (p=0.01), 77% reduction in total bed days for the 'Full HARP' group – the largest reduction of the three groups. Notably, in the six months preceding HARP, of the three groups, the 'Full HARP' group were generally less likely to be admitted and accumulated less bed days.

Table 4: Total Number of Admissions, Number of Service Users Admitted and Total Bed Days Accrued

Group	Pre-HARP			Post-HARP				
	Total Admissions*$^{\alpha}$ [mean per service user$^{\varsigma}$]	**Total Service Users Admitted**	**Total Bed Days$^{\alpha}$ [mean per service user$^{\varsigma}$]**	**Total Admissions*$^{\alpha}$ [mean per service user$^{\varsigma}$]**	**Change From Pre-HARP$^{\beta}$**	**Total Service Users Admitted**	**Total Bed Days$^{\alpha}$ [mean per service user$^{\varsigma}$]**	**Change from Pre-HARP$^{\beta}$**
Full HARP	88 [0.98]	38	139 [1.54]	32 [0.35]	64%↓***(p=0.002)***	21	33^{t}[0.36]	77%↓ ***(p=0.01)***
Assessment +	150 [1.66]	49	220 [2.44]	64 [0.7]	58%↓***(p=0.02)***	23	102[1.13]	54%↓***(p=0.04)***
Declined All	87 [0.97]	45	257 [2.85]	45 [0.5]	49%↓***(p=0.002)***	23	263 [2.92]	2%↑

* , admissions <24 hours are not always recorded (i.e. may be recorded as *'LOS 0'* or not recorded at all); $^{\alpha}$, between group analysis conducted using one-way ANOVA;
$^{\beta}$, within group analysis pre- and post-HARP conducted using paired t-tests; $^{\varsigma}$, mean calculated based on all 90 within each group;
^{t}, these data exclude one service user who accrued 167 bed days – including this in analysis results in total bed days of 200 [2.22 per service user] and a 31% increase from pre-HARP;
bold type, statistically significant (p<0.05) result (non-significant outcomes not displayed); ↓, decrease; ↑, increase.

5.6.3 Admission Patterns (Table 5)

For all three groups, when compared to the six months preceding HARP referral, there were reductions across all numbers of admissions, and bed days accrued, per service user, in the six months following referral. The one exception to this finding was no change to the number of service users accruing 14+ bed days within the 'Declined All' group. Furthermore, compared to the other two groups, the 'Declined All' group had higher numbers of service users accruing 7-13 or 14+ days, both pre- and post-HARP. Both findings perhaps explain why total bed days for this group were higher, and increased post-HARP.

For all three groups, those who were admitted in the six months preceding, or following HARP referral, were most likely to be admitted once or twice. For the 'Full HARP' group, the largest reduction post-HARP was observed in service users accruing three or four admissions, whilst the other two groups demonstrated their largest reductions in those admitted twice or three times. For all three groups, the largest reduction in bed days post-HARP was observed for those who accrued two days.

Table 5: Admission Patterns

Data Per Service User	Of Those Admitted Within Each Group								
	Full HARP			Assessment+			Declined All		
No. Admissions* Accrued	Pre-HARP	Post-HARP	Change	Pre-HARP	Post-HARP	Change	Pre-HARP	Post-HARP	Change
1	15	13	14%↓	28	13	54%↓	25	13	48%↓
2	11	6	45%↓	12	4	66%↓	12	6	50%↓
3	9	1	89%↓	2	0	100%↓	4	1	75%↓
4+	3	1	66%↓	7	6	15%↓	4	3	25%↓
	(= 38)	(= 21)		(= 49)	(= 23)		(=45)	(=23)	
Bed Days Accrued									
1	8	5	38%↓	13	8	39%↓	11	5	55%↓
2	12	2	84%↓	4	1	75%↓	6	1	84%↓
3-6	6	3	50%↓	12	5	59%↓	8	4	50%↓
7-13	3	1	66%↓	4	3	25%↓	10	2	80%↓
14+	2	1	50%↓	5	2	60%↓	5	5	0

* , admissions <24 hours are not always recorded (i.e. may be recorded as *'LOS 0'* or not recorded at all); ↓, decrease; ↑, increase.

5.6.4 Summary and Conclusions

The 'Assessment+' group had the highest number of total admissions, both pre- and post-HARP referral, whilst the 'Declined All' group had the highest number of total bed days at both time points. The 'Full HARP' group were generally less likely to be admitted, and accrued the least bed days in the six months preceding HARP referral – suggesting that they were more medically stable from the outset, therefore most able to undertake Tier Three exercise/education.

For all three groups, there were significant reductions in numbers of total admissions and reductions in numbers of service users admitted in the six months following HARP referral – indicating that HARP referrals were appropriate and well-timed to a period of relative medical stability. Additionally, when compared to the six months preceding HARP referral, there were reductions across all numbers of admissions, and bed days accrued, per service user.

With one outlier excluded, the 'Full HARP' group demonstrated the largest reduction in terms of total bed days, post-HARP. The 'Assessment+' group also demonstrated a smaller, though statistically significant reduction in total bed days, whilst the 'Declined All' group was the only group which failed to demonstrate a reduction - with no change to the number of service users within this group accruing 14+ bed days or more. These findings suggest that there is a cumulative benefit (reduction in unscheduled admissions) to be gained from accessing more of the Tier Three 'package' (i.e. benefits attained from attending for comprehensive assessment plus increase with uptake of exercise classes/education). Within this conclusion it should be acknowledged that the 'Full HARP' group was the most medically stable of the three, the time periods examined (six months) were relatively short, and analyses were based on relatively small numbers of service users.

5.7 Service Improvement Projects

5.7.1 A Person Centred Approach to Rehabilitation and Self-Management in Long Term Conditions

Aim: The aim of the project was to evaluate whether HARP's Tier Three enables service users to feel confident to self-manage their condition(s), and to establish staff confidence to deliver supported self-management.

Methods: Questionnaires were used to gather lifestyle change information and confidence to self-manage scores from service users on a 0-10 scale (10 = completely confident, 0 = not confident at all), at three time points: pre-Tier Three, upon completion of Tier Three, and three months after completion. Staff confidence to deliver supported self-management was established via an online survey.

Results: From 19 service user questionnaires, mean confidence to self-manage score pre-Tier Three was 5.4 and upon completion was 8.9 - giving an average improvement of 64% (confidence to self-manage is considered established with a score of >7). Three months after Tier Three, mean confidence to self-manage score had diminished by 4% to 8.5. 100% of staff delivering HARP reported >75% confidence to deliver supported self-management.

Conclusions: Tier Three enables service user to feel confident to self-manage their long term condition, and this was maintained after completion of HARP. Staff feel confident to deliver supported self-management.

5.7.2 Why do Patients with Long Term Conditions Fail to Attend Rehabilitation?

Aim: This project aimed to determine perceived barriers to HARP Tier Three class attendance and to assess service user satisfaction in relation to the initial HARP clinic appointment.

Methods: From Jan-May 2016, service users who failed to attend / continue Tier Three exercise and education were lettered for feedback on their barriers to attendance, and on their satisfaction with their comprehensive assessment clinic appointment. Telephone calls were used to collect data in those who did not respond to the letter.

Results: Within the time period, 18 service users (mean age 60.8yrs, range 49-81yrs; 10males / 8 females) were identified as failing to attend / continue. Primary diagnoses were: cardiac (n=9), pulmonary (n=5), cancer (n=4), and the most common secondary diagnosis was pain (n=9). Responses were only available from 15 individuals, and the most prevalent attendance barrier (cited ten times) was the limiting effect of medical conditions. Eleven completed a 0-10 scale to rate their clinic satisfaction (10=extremely satisfied, 0=extremely dissatisfied), and scores ranged from 4-10 (mean 8). None of the respondents gave suggestions on how the clinic could be improved upon.

Conclusions: Whilst the limiting impact of a medical condition is often unavoidable, perhaps HARP should incorporate pain management education to better meet service users' needs. Service users appear satisfied with the service provided at HARP assessment clinic.

6. Tier Four

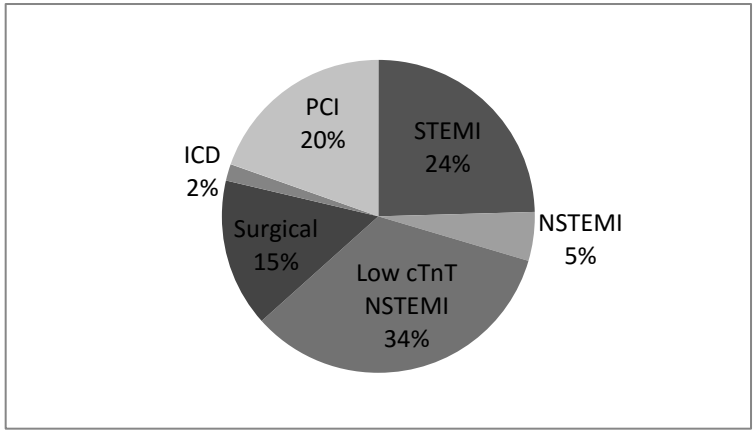
Within the time period, the HARP team's immediate priorities for Tier Four were to ensure that the longstanding quality and effectiveness associated with both the cardiac and pulmonary rehabilitation services were not diminished or diluted with creation of the new model.

With establishment of HARP, Tier Four service users began to benefit from wider availability of MoT (more programmes running) and Weigh to Go (more sessions available) throughout Ayrshire, and those attending cardiac rehabilitation within East Ayrshire had the opportunity to participate in the Walking Football Pilot. In Ardrossan and Auchinleck, merging the resources and expertise of staff from Tiers Three and Four enabled HARP to widen access to rehabilitation within these areas. Both at Tier Four and combined Tier Three/Four exercise/education sessions, there was additional support provided by leisure staff (the aim being to facilitate a more seamless transition into Tier Two), and by volunteers (via the *Activity Friend* project). Furthermore, the teams delivering cardiac and pulmonary rehabilitation expanded, and as clinicians began to work between Tiers Three and Four, supported by structured training and informal learning opportunities, they gained a broader knowledge and skill set across a range of conditions (other than cardiac or pulmonary disease), enhancing the expertise and quality of care available to those within that tier.

6.1 Cardiac Rehabilitation Activity

Within the time period, there were 1332 referrals (mean age 67 years, 874 males / 457 females) to Tier Four cardiac rehabilitation. The total number of referrals into Tier Four cardiac rehabilitation has been increasing over the past few years (1232 in 2013/14, 1264 in 2014/15, 1287 in 2015/16) – thus 1332 continues the trend. The mean age, gender split and diagnostic breakdown within the time period is also typical. The diagnostic breakdown of referrals is shown in **fig. 9**:

Figure 9: Diagnostic Breakdown* of Cardiac Rehabilitation Referrals



*[*ICD, implanted cardioverter defibrillator; PCI, percutaneous coronary intervention; STEMI, ST-elevation MI (myocardial infarction); NSTEMI, non ST-elevation MI; lowcTnT NSTEMI, non ST-elevation MI with Troponin T <1]*

Of the 1332, all 839 with a diagnosis of STEMI, NSTEMI or low cTnT NSTEMI received cardiac rehabilitation nursing input in hospital. After discharge, across all diagnoses, 813 service users were fully assessed at a Tier Four cardiac rehabilitation clinic (others were either awaiting further medical / surgical management, too unfit, or declined). Of the 813 assessed, 439 enrolled in Tier Four cardiac rehabiliation exercise/education sessions.

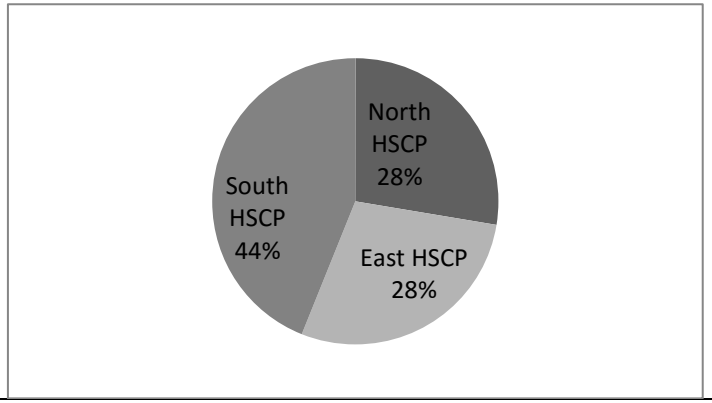
Of those service users who presented at the start of Tier Four cardiac rehabilitation with cardiovascular risk factors out with recommended targets, percentages of those reaching or improving towards targets by the end of the programme were:

- ✓ Smoking - 93%
- ✓ Blood pressure - 53%
- ✓ Cholesterol – 40%
- ✓ Body Mass Index – 48%
- ✓ Waist Circumference – 55%
- ✓ Alcohol Intake – 44%
- ✓ Hospital Anxiety and Depression Score – 68%
- ✓ Physical Activity Level – 99%

6.2 Pulmonary Rehabilitation Activity

For the time period, 647 service users were referred to Tier Four pulmonary rehabilitation, and of those 647, 356 were assessed at a Tier Four pulmonary rehabilitation clinic. Of the 356, 123 enrolled in Tier Four pulmonary rehabilitation exercise/education sessions (**fig. 10**):

Figure 10: Service Users Starting Class (By Partnership)



7. Other HARP Work

7.1 Social Media and Publicity

The HARP team is very aware of the importance of ongoing communication and engagement with its stakeholders and service users. HARP's use of Twitter is consistent and promotes its activity and provides regular healthy lifestyle messages. As informal feedback from service users suggested that they tend to favour Facebook (with most Twitter interactions appearing to be with other health and social care professionals), HARP's Facebook page is now under development. The primary aim of the Facebook page will be to provide service users with access to specialist health education video sessions and to reiterate the healthy lifestyle messages from TWITTER. The HARP team is very aware that there is huge future potential to further develop the programme's presence, role and impact within social media.

The HARP project itself has also generated national interest and its background, aims, methodology and early outcomes have been disseminated at various conferences, where its potential as an innovative model of care has been recognised. These conferences include the annual conferences of the BACPR, Cardiac Rehabilitation Interest Group Scotland (CRIGS), Macmillan, and the Wales Cancer Network. The project has also been monitored by the European ICARE4EU project.

7.2 Awards and Nominations

The HARP project has been nominated for a number of awards:

- Finalist *National Health Care Awards* 2016
- Finalist and runner-up *The Alliance Self Management Programme of the Year* 2016
- Nominated *Ayrshire Achieves Team of the Year* 2016
- Finalist *North Ayrshire HSCP Awards* 2016
- Finalist *Team of the Year Ayrshire Achieves* 2017

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