

# The Future Challenges

## Young People and Mental Health: SmartGym



## The Future Challenges

Young People and Mental  
Health Resilience



## Learning and outcomes from the SmartGym project (part of the Future Challenges programme)

A report of findings from the independent evaluation conducted by Wessex Academic Health Science Network (AHSN) and feedback from the programme team and stakeholders. February 2022.

**Evaluation report author:** Dr Catherine B. Matheson-Monnet, Senior Research Fellow

**Learning and Outcomes Report collated by:** Genevieve Riley, Senior Programme Manager, West of England Academic Health Science Network (AHSN)

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## Innovator response to the project

### Reflections from Rugged Interactive and the Anna Freud Centre:

We're very proud to have managed to keep this project running during the disruption of the Covid-19 pandemic. In this context, the extensive number of positive outcomes achieved is all the more rewarding. The changes that Covid-19 forced us to make were actually very beneficial for the evolution and future roll-out of SCRP, as we were required to leave more of the coaching and direction to school staff.

The students chosen to take part were amongst those at highest risk of exclusion. The fact that all students saw tangible benefits from improved resilience, based on improved executive function skills, is particularly satisfying.

Potentially the biggest disappointment was that the peer mentors' role was so restricted due to the pandemic, and we were unable to measure the benefits that the Cohort 1 peer mentors experienced. The next SCRP trial should enable us to quantify the value of the peer mentors – to both the participating cohort and to the mentors themselves – much more effectively, and we expect it to be substantial.

The programme was designed to support both the physical and mental wellbeing of any student. We noticed the week-by-week improvements, as was evidenced in the outcome "parents identified better mood, a better ability to focus on the task at hand and a greater motivation to be more physically active." This combined physical and mental health offer was much needed during the pandemic when other services were unavailable. Seeing the school continue to deliver this intervention under very stressful conditions, was extremely rewarding.

The pandemic lockdowns forced us, as innovators, to vary the length and frequency of the model for Cohort 2. The programme was adapted to ensure each pupil had sufficient time which the school was able to manage within very difficult time constraints.

Though the students selected were boys of concern, the mentor programme was populated with equal gender. Both male and female students participated well and engaged with the physical and mental health aspects of SmartGym. They needed to do this to become coaches. In other trials, we have had a wider selection of gender, age and problems when delivered to the whole class. Similar results to the SCRP were found and recorded elsewhere.

Complex problems need innovation based on good evidence. The West of England AHSN enabled that much needed innovation, which engaged and motivated children without fear of stigma, contributing to better outcomes for those vulnerable children. We watched the participants demonstrate SmartGym at a school for children with special educational needs and disabilities (SEND), and they did it with competence and pride. Staff were also engaged in the fun, which was important when staff morale was at risk.

**School testimonial captured after the evaluation ended:**

‘The students were 100% enthralled and involved in the activities, both physically and mentally, and thoroughly enjoyed tracking their own progress throughout the programme. Students formed relationships with the other students on a positive level whilst encouraging each other to improve on their performance, as well as concentrate on their own performances.

The students were also able to look at their own behaviour more positively and control any unwanted behaviour that may have taken place before in lessons. There were more periods of time when there was focused attention than not. There were less times of distraction.’

**Martyn John, Assistant Principal / Head of PE & SmartGym Project Lead**

## Background to the programme

[The Future Challenges programme](#) is a central part of the West of England AHSN’s remit to support innovation in health and care and delivered as part of the commission from the Office of Life Sciences to aid the adoption and spread of promising innovations. The aim of the programme is to identify and articulate local healthcare challenges and develop a system where healthcare professionals can connect with small and medium enterprises (SMEs) to support the development of healthcare solutions.

In June 2019, the SmartGym CardioWall® Resilience Programme (SCRP) from [Rugged Interactive](#)<sup>1</sup> and the [Anna Freud National Centre for Children and Families \(AFC\)](#) was one of the innovations chosen by an expert panel from a wide range of submissions. [Gloucestershire Health and Care NHS Foundation Trust](#)<sup>2</sup> (GHC) and [Newent Community School and Sixth Form Centre](#) in Gloucestershire were matched to the project as a suitable pilot site, due to their commitment to supporting children’s resilience as part of their emotional development, and to creating a diverse and inclusive culture. As the school was an early adopter of Young Minds Matters [YMM] [YoungMinds | Mental Health Charity For Children And Young People | YoungMinds](#), with established named links from the locality mental health support team, it was identified as an ideal setting to pilot the SCRCP.

GHC and the school collectively saw the potential for SCRCP to provide an alternative way in which to engage young people through physical activity, mental challenge, and fun. There was interest in testing and developing the broader appeal of using SCRCP with vulnerable students who struggle to manage their focus; in particular, the potential for SCRCP to be used as a mechanism to support children who benefit from the use of physical activity to support emotional and sensory processing regulation and enhance attention.

<sup>1</sup> Rugged Interactive is the trading name for Design for Sports Limited.

<sup>2</sup> Gloucestershire Health and Care NHS Foundation Trust was formed in October 2019. This followed the merger of 2gether NHS Foundation Trust and Gloucestershire Care Services NHS Trust, to provide joined up physical health, mental health and learning disability services.

In parallel to this, specialist evaluators based at the [Wessex Centre for Implementation Science](#) (WCIS), previously part of Wessex AHSN, were also identified via a separate tender to provide an independent assessment of the impact and effectiveness of this programme.

## The mental health context

Studies show that existing mental health interventions fail to engage the most vulnerable children. Children with untreated behavioural problems are more likely to leave school without a qualification, experience drug or alcohol problems and become unemployed.<sup>1, 2</sup> Drop-out and non-attendance rates can be as high as 40% (28% - 75%).<sup>3</sup> Boys and men are less likely to engage in talking therapies, which may result in untreated and embedded lifetime mental health disorders.<sup>3,4,5</sup> There is a clear need for an innovative, accessible and non-stigmatising approach to these problems.

## The importance of resilience

Resilience is an important attribute required by young people in the modern world. It is defined as the 'capacity of a system to adapt successfully to challenges that threaten the function, survival, or future development of the system.'<sup>6</sup> Being resilient describes the ability of an individual, a community, or a system to withstand stress and challenges. At an individual level, resilience has been linked to mental and physical health across the life course.<sup>7</sup> School-based health promotion approaches can be cost-effective ways of contributing towards building resilience<sup>8,9</sup> and leading to longer-term positive impacts in adulthood.<sup>10</sup> For example, regular participation in sport groups has been shown to be protective resilience resource in childhood, as well as in later adulthood.<sup>11</sup>

School-based health promotion approaches are most effective when implemented across the whole school rather than through discrete health promotion lessons, particularly if health is specifically integrated in the curriculum.<sup>9,12</sup> School-based health promotion activities, rolled out as a whole-system, multi-level approach (embedded in school ethos, curriculum and linked to wider support networks), have been shown to have a positive impact on increasing resilience in teachers and students,<sup>8,13,14</sup> as well as improved level of partnership between schools, health service providers, and families.<sup>15</sup>

Childhood resilience moderates the increased risks to mental health from adverse childhood experiences (ACEs).<sup>11</sup> Personal, relationship and community resilience resources such as social and emotional skills, childhood role models, peer support, connections with school, understanding how to access community support, and a sense that your community is fair to you are strongly linked to reduced risks of mental illness across the life course.<sup>11</sup>

High childhood resilience is related to substantial reductions in lifetime mental illness and potentially offers protections even in those with no ACEs.<sup>11</sup> The ambition and purpose of SCRP is to help young people improve their mental wellbeing, by learning crucial resilience skills that they will require in their present and later life.

## The intervention

The SCRP is a combined physical and mental health intervention that sidesteps the stigma and lack of youth-appeal of ‘mental health’ and delivers help when, and where, young people need it. It aims to help students “feel good and function well”.

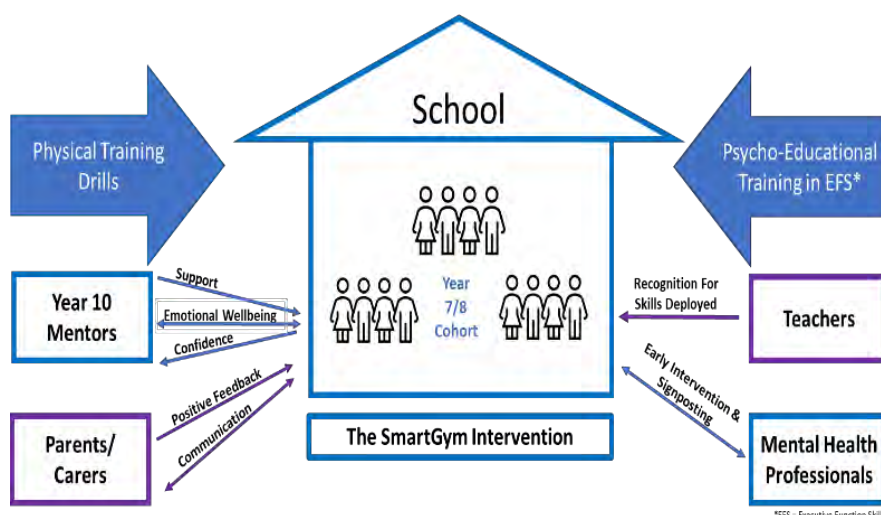
Innovator evidence<sup>3 4</sup> of CardioWall® use in a primary school setting showed positive impact on physical fitness, co-ordination, motivation to exercise, teamwork, social interaction and mental well-being.<sup>16</sup> CardioWall® was particularly useful in helping disruptive students<sup>5</sup> focus better on school work and improving the self-confidence of students with low self-esteem.<sup>6</sup> More recently, a SmartGym CardioWall® model was piloted in five London-based primary schools, using either or both targeted and universal approaches, depending on the needs of each school. The key benefits were better self-regulation of emotions, improved concentration and confidence, improved relationships with peers and fewer hyperactivity-related problems.<sup>17</sup>

The SCRP is a technology-enabled programme that engages students in a powerful combination of mental, physical, and cognitive development exercises. Students work individually and in pairs or groups on physical activity drills using a CardioWall® Reaction Trainer. These drills are designed to develop the students’ executive function skills (EFS), e.g., decision-making, flexible thinking, working memory, sustained attention etc.

Teachers and SmartGym coaches (peer mentors) deliver a weekly programme of mental and physical health education. The ‘dosage’ of the SCRP is set to 10 x 45 minutes sessions, in the knowledge that this could be increased for certain students if required. SCRP sessions comprise a psychoeducational component, recording of well-being, explanation of the goal of the session, CardioWall® training drills, recording of CardioWall® scores, reflection and recording of strategy plan to achieve goals.

Focused initially on students in Year 7 with varied behavioural and attention related problems, (with the school later including Year 8), SmartGym also has the potential to be rolled out widely across other secondary school year groups, once members of staff are confident in delivering the programme.

**Figure 1: The SmartGym model**



<sup>3</sup> <https://www.rugged-interactive.co.uk/fowey-primary-school-study>.

<sup>4</sup> <https://www.rugged-interactive.co.uk/roche-community-primary-school>

<sup>5</sup> <https://www.rugged-interactive.co.uk/fowey-primary-school-study>.

<sup>6</sup> <https://www.rugged-interactive.co.uk/roche-community-primary-school>

## Target beneficiaries

The SCRP has been designed in such a way that it can be used as a targeted intervention to offer crucial early support for the most vulnerable young people and/or as a universal intervention<sup>18</sup> to improve wellbeing outcomes for all young people in a school.

Due to its potential value to improve outcomes for young people, in line with the key priorities of the local health providers, the real-world validation of the SCRP in Newent Community School was piloted as a targeted intervention for a selected small number of secondary school students. The West of England AHSN utilised a co-design-based process with the innovator, clinical host, school and evaluator, to design and plan a project to explore the potential value of the innovation for young people's mental health resilience.

A key element of the SCRP approach is to provide support that helps people to share their experiences, build positive connections and create a language to discuss emotional responses to experiences. Whilst SCRP allows targeted group work, the variety of the CardioWall® programmes also provides an opportunity for students to improve fitness and mental wellbeing. The approach aims to develop knowledge and understanding of some of the key principles of fitness, such as coordination, motor skills and reaction time. The SCRP offers a universally accessible programme as well as providing more specialist input for those children who require a more focused package of support.

For this project the CardioWall® itself was also made available to students and teachers within the school. The variety of the CardioWall® programmes would have provided an opportunity for those who might have made use of it to improve their fitness and mental wellbeing.

However, the purpose of the real-world validation of the SCRP was targeted group work, with a small number of selected students to help them 'feel good and function well'.

The SCRP does not require the specialist skills of a qualified mental health professional to deliver and, as such, was perceived as aligning with and enhancing the YMM (Young Minds Matter) programme's whole school approach.

## Evaluation aims and objectives

[Wessex AHSN](#) was commissioned by the West of England AHSN in 2019 to evaluate the project, which was undertaken by Wessex Centre of Implementation Science ([WCIS](#)).

### Primary objective

1. To ascertain the extent to which the programme helped students 'feel good and function well' as well as improve their executive functioning skills and coping strategies (cognitive, emotional, and social skills).

### Secondary objectives

2. To identify additional benefits and limitations of the programme.
3. To assess the extent to which the programme could become routine practice within the school (e.g., drivers and barriers, pathway changes necessary to integration within the curriculum, pastoral care system, other MH initiatives and clinical pathways.)



## Methods

### Scope, design, data collection and sampling strategy

A detailed logic model, co-designed with partners, informed a real-world mixed-methods formative and summative independent evaluation, underpinned by a validated conceptual framework based on the Normalisation Process Theory (NPT). Qualitative data was collected to provide insights into underlying complex social processes.<sup>19,20,21</sup> Quantitative data was collected to enable the identification of patterns of similarities and differences.<sup>22</sup> Data was collected at baseline, during the programme and after the end of the programme. The multiple data sources and time points enabled cross-referencing to further enhance the robustness, reliability, and validity of the evaluation.<sup>23</sup>

Information was given to parents, students, and members of the school staff about the programme and its evaluation, including about confidentiality, anonymity and data management, and informed consent was received from all participants. A Data Protection Impact Assessment (DPIA) was also carried out. This was reviewed and approved by partner Data Protection Officers. Ethics approval was received from the University of Southampton.

Students were sampled purposively and selected by the school to take part based on those whom the school felt would gain the most benefit. This included those who were failing to thrive at school and could potentially be at risk of exclusion and those with a social, emotional, and mental health (SEMH) profile who may be reluctant to access help.

As planned, two cohorts were put forward (C1 n=10 boys; C2 n=8 mixed boys and girls). Due to selection criteria and other reasons, including the restrictions imposed on schools due to Covid-19 pandemic, the second cohort was delayed, and each cohort had slightly different intervention delivery models (see Figure 2).

### Data collection and analysis

Primary outcome data was collected using a range of behavioural, mental health and wellbeing assessment tools (within the workbooks and additional to the workbooks) from each cohort (Table 1). Quantitative survey data was analysed numerically using SPSS 24.00 software for descriptive statistics and statistical analysis. Qualitative data was analysed using thematic analysis<sup>24,25</sup> and the Normalisation Process Theory.<sup>19,20</sup>

**Table 1:** Description and rationale for each of the behavioural, mental health and wellbeing assessment tools

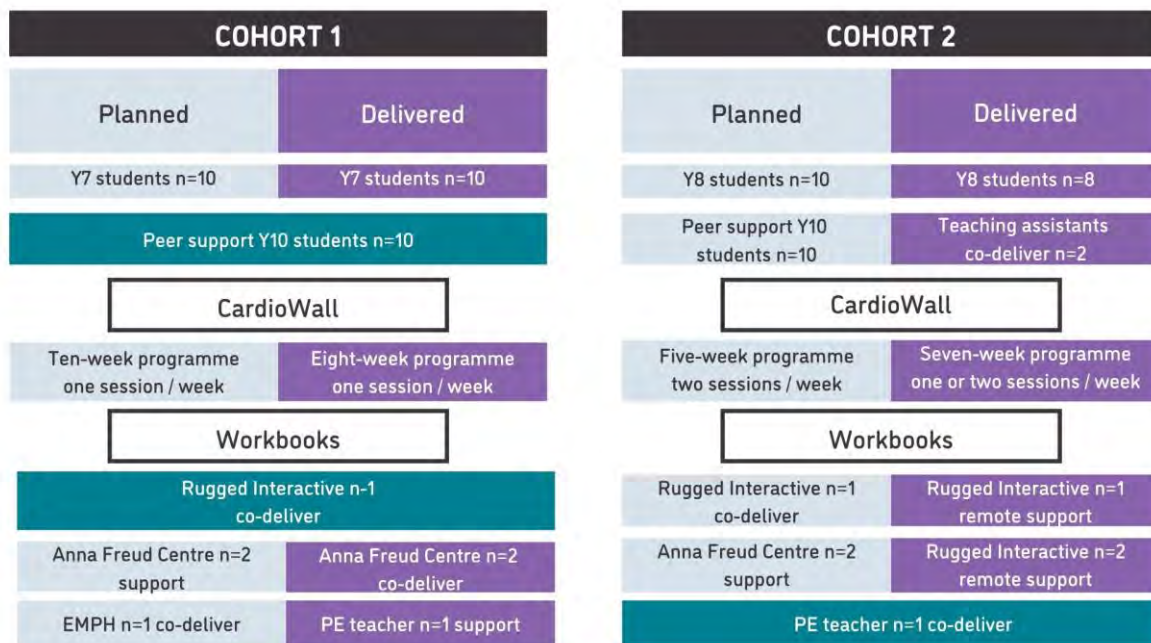
Tool	Description	Rationale
Strengths and Difficulties* Questionnaire (SDQ)	<p>A short behavioural screening questionnaire for children aged three to 16. It is used to assess children's mental health and can be completed by children and young people themselves, by their parents or by their teachers. The questionnaire has 25 questions and covers:</p> <ol style="list-style-type: none"> <li>1) Overall stress</li> <li>2) Emotional distress</li> <li>3) Behavioural difficulties</li> <li>4) Hyperactivity or concentration difficulties</li> <li>5) Getting along with other young people</li> <li>6) Kind and helpful behaviour</li> </ol>	To establish a baseline and better understand how students perceive themselves and how they are perceived by their teachers or parents. The questionnaires were completed by teachers and parents.
Children Outcomes Research Consortium (CORA) Student Resilience Survey*	<p>A 47-item measure comprising 12 subscales measuring students' perceptions of their individual characteristics, as well as protective factors embedded in the environment:</p> <ol style="list-style-type: none"> <li>1) Communication and cooperation</li> <li>2) Self-esteem</li> <li>3) Empathy</li> <li>4) Problem Solving</li> <li>5) Goals and aspirations</li> <li>6) Family connection</li> <li>7) School connection</li> <li>8) Community connection</li> <li>9) Autonomy experience,</li> <li>10) Pro-social peers</li> <li>11) Meaningful participation in community activity</li> <li>12) Peer support</li> </ol>	To establish a baseline and better understand how students perceive themselves and how they feel that they fit within their environment and the extent to which they feel that their environment at home, school and outside of school excluding school is supporting them.
Cognitive Abilities Tests (CATs)*	CAT scores assess cognitive ability in three areas: verbal (thinking with words); quantitative (thinking with numbers); and non-verbal (thinking with shapes and diagrams, which can be further sub-divided into spatial reasoning (thinking in 3D). Results take age into account and are given in Standardised Age Scores.	Used by the school to monitor progress and identify areas for extra support. CATs are broad indicative snapshots of intellectual ability and potential future achievement.

<b>Tool</b>	<b>Description</b>	<b>Rationale</b>
Negative behaviour points	Routinely used by the school for all students, if required, and completed by form tutors based on assessment from teachers.	Used by the school as part of the criteria to select the students who were offered the opportunity to take part in the SCRP.
Workbooks: CardioWall® scores <sup>7</sup>	Diaries used by the students to record weekly scores for each of the CardioWall® games (Chaser, ClearOut, ClusterShot and CardioBeat) they undertook to perform their attention skills.	Used to track progress and motivate the students. By plotting results on a graph in their workbooks, they could visualise progress over time.
Workbooks: Wellbeing diaries	Diaries used by the students to record on a weekly basis: energy, mood, anxiety, physical activity, diet and sleep.	Used as baseline and to track the perceived well-being of students along physical and psychological and emotional dimensions.
Workbooks: Executive function skills (EFS) baseline	Completed by the students to measure self-perceived EFS alongside five dimensions: remember instructions; get started quickly on most tasks; think of a problem from a different point of view; talk about emotions when angry, upset or worried; and control of self when angry or upset.	Used as baseline to help students focus their efforts and, at the last session of the SCRP, to ascertain self-assessed extent of progress.
Workbooks: Executive functions skills (EFS) deployment	Diaries used by the students to record which attention skills (sustained, selective or flexible) they performed in which class, how they went on, what happened and who noticed.	Used by students to reinforce what they learnt during the SCRP and facilitate self-reflection.
Assessment by teachers of extent to which students deployed EFS	Teachers' assessment of performance in each subject including ratings for each of sustained, selective and flexible attention skills.	Used by the School to assess progress generally and progress in deployment of EFS.

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<sup>7</sup> CardioWall® higher scores indicated better game success

**Figure 2: Cohort changes made to delivery model because of Covid restrictions**



## Impact of Covid-19 on data collection

Due to the pandemic and the school being closed, the last two Cohort 1 sessions at the end of March 2020 were cancelled. Restriction/limitation of travel two weeks before the school was closed down led to the programme being delivered by the school (not AFC and Rugged Interactive). The abrupt end of the programme and adaptations made at short notice meant that some planned routine data collection did not take place, which reduced the 'full picture data' of results. Focus groups with students and interviews with staff, which were planned for the end of March, had to be replaced by individual interviews with eight out of 10 students and parents of three students over video calls, which took place months after the abrupt end of the programme. This is likely to have led to some students lacking memory of certain aspects of the programme. One teacher was also interviewed by phone.

The evaluation of Cohort 2 was more heavily impacted. Recording of data by students in their workbooks during sessions at the beginning and end of the SRCP, and also each week, was reduced, due to the limited number of staff and there being no physical presence from AFC and Rugged Interactive. The executive functioning skills before and after scores were not collected. The planned end-of-programme focus group with students, and interviews with teachers and parents, were not conducted due to time restrictions and school closures linked to the second national lockdown, but four out of eight students completed a survey. No parents or teachers were interviewed, but two parents and six teachers provided semi-structured feedback through a survey. Only half of the data collection instruments, most of which were an integral part of the SCRP, were used for both Cohort 1 and Cohort 2. The other half was only available for either Cohort 1 or Cohort 2. A detailed description of data collection instruments and sample sizes can be found in the detailed unabridged evaluation report.<sup>8</sup>

<sup>8</sup> See Matheson-Monnet CB (2021) *Independent evaluation of the piloting of the SmartGym programme in Newent Community School*. pp79 PURE ref 9164909. Southampton: Wessex Centre for Implementation Science/University of Southampton/Wessex Academic Health Science Network.

## Findings

**Results for primary objective: did the programme help students to 'feel good and function well,' improve their EFS and coping strategies?**

### **Students' wellbeing: energy, mood, and anxiety**

Each week of the programme, the students were asked to complete information in their workbooks about energy, mood, anxiety, physical activity, diet and sleep.

#### **Key findings for energy, mood, and anxiety (Cohorts 1 & 2 combined):**

31% (n=5) improved in all three categories (energy, mood, and anxiety). 56% (n=9) reported they were wider awake; 13% (n=2) reported they were less wide awake, and 31% (n=5) had no change.

56% (n=9) had more good feelings or better mood; 44% (n=7) had no change in mood. 19% (n=3) were less worried or less anxious; 50% (n=8) had no change in worry or anxiety; 31% (n=5) were more worried or more anxious.

#### **Key findings for energy, mood, and anxiety (Cohorts 1 and 2 compared):**

At baseline, Cohort 1 reported much lower energy, comparable mood, and much lower anxiety than Cohort 2. Both cohorts improved their energy level, but Cohort 1 improved a lot more than did Cohort 2.

Mood and good feelings improved substantially for both cohorts, but slightly more for Cohort 2. Anxiety and worry had slightly increased for Cohort 1 students, who had very little anxiety and worry at baseline, but slightly decreased for Cohort 2 who had a much higher baseline.

### **Students' wellbeing: physical activity, diet, and sleep**

Students completed free-text questions each week about the average daily number of physical activities they did outside of school, their average daily intake of fruits and vegetables and their nightly average number of hours of sleep.

### **Key findings for physical activity, diet, and sleep (Cohorts 1 & 2 combined):**

13% (n=2) improved on all three categories (physical activity, diet and sleep). 33% (n=5) were more physically active, 40% (n=6) had no change and 27% (n=4) decreased their physical activity.

60% (n=9) increased their daily intake of fruit and vegetables, 27% (n=4) had no change and 13% (n=2) decreased their intake.

40% (n=6) increased their amount of nightly sleep, 33% (n=5) had no change and 27% (n=4) decreased their amount of sleep.

### **Key findings for physical activity, diet, and sleep (Cohorts 1 & 2 compared):**

At baseline Cohort 1 reported more daily physical activities, more daily fruit and vegetables and more sleep than Cohort 2. Cohort 2 had a 50% increase in weekly exercise from 40 minutes to one hour whilst Cohort 1 had a 75% decrease (from one hour 20 minutes to 20 minutes).

Both Cohorts improved their average daily fruit and vegetable intake, but Cohort 1 improved less than Cohort 2, from four to five pieces for Cohort 1 (25% better) and from three to four pieces for Cohort 2 (33.3% better).

Both cohorts improved their average nightly sleep, by an average of 40 minutes for Cohort 1 (from eight hours to eight hours and 40 mins) and by an average of 30 minutes for Cohort 2 (from seven hours 10 minutes to seven hours and 40 minutes).

### **CardioWall® scores**

To determine progress, a percentage of improvement was calculated from the baseline scores compared to recorded scores at the last session (difference post and pre divided by pre). Comparing the overall average scores for the main three CardioWall® games at baseline and last session shows improvement in all of them for both Cohort 1 and Cohort 2.

### **Key findings for CardioWall® scores (Cohorts 1 & 2 combined):**

- The average improvement of Cohort 1 students was 30% better than for Cohort 2, despite Cohort 2 (who were nine months older) having a higher baseline than Cohort 1.
- ClusterShot had a 4% improvement for Cohort 1 [n=8] and 26% improvement for Cohort 2 [n=8].
- Chaser - a game requiring selective attention skills - had a 50% improvement for Cohort 1 [n=4] and 13% improvement for Cohort 2 [n=8].
- The most improved game was ClearOut across both groups [73% for Cohort 1 and 41% for Cohort 2] but POST data for Cohort 1 was captured for only n=1 student.
- ClearOut is a game closely aligned with sustained attention, where the aim is to clear all the light pods as quickly as possible within a certain timeframe. An improvement in this score signifies an improvement in focus, as well as accuracy and speed.

### **Core executive function skills (EFS) (Workbook - Cohort 1 only)**

Students were asked to rate themselves in relation to five EFS statements on a scale of 1 to 10 (1=not at all and 10=good) at two timepoints; at the start of week one and end of week eight.

### **Key findings for core EFS (Cohorts 1 only):**

- All students had substantially improved by the end of the programme.
- The overall average improvement for all five questions was +4.2 (3.3 to 7.5).
- All students were below the midpoint of 5.5 at baseline and all were at or above it at the end of the programme.
- The most improved was 'get started quickly on most tasks', with an average of 3.3 pre, improving to 7.8 post.
- The Wilcoxon Signed-Rank Test showed significant differences ( $p<.05$ ) for all five questions, but the sample was very small [n=8].

### **Behaviour points (Cohort 2 only)**

Students are given behaviour points at school when they exhibit negative behaviour. More points mean having demonstrated more behaviour that is negative. In the second week of the programme, there was an overall decrease in behaviour points to 1.4, then a steady increase. This is not unusual for self-improvement interventions and may reflect higher expectations from their teachers. The disruption caused by the Covid-19 pandemic is also likely to have affected all students' behaviour, as they did in other educational settings.

**Key findings for behaviour points (Cohort 2 only):**

- The average number of behaviour points per student each week, over the five weeks before the start of the programme was 1.8 (the aim is to have 0 behaviour point).
- At the end of the programme, the baseline had increased by +0.3 to 2.2 points weekly.
- The higher average at post compared to pre is due to
  - 50% (n=4) increasing their behaviour points by 0.7 to 1.6
  - 13% (n=1) had no change
  - 38% (n=3) decreased their behaviour points by 0.2-0.5 points

**Attention skills deployment**

SCRIP focuses on three attention skills (selective, sustained, and flexible). Students from both cohorts were asked to self-report data regarding their use of these skills. Students reported attention skills irregularly and with varying amounts of detail.

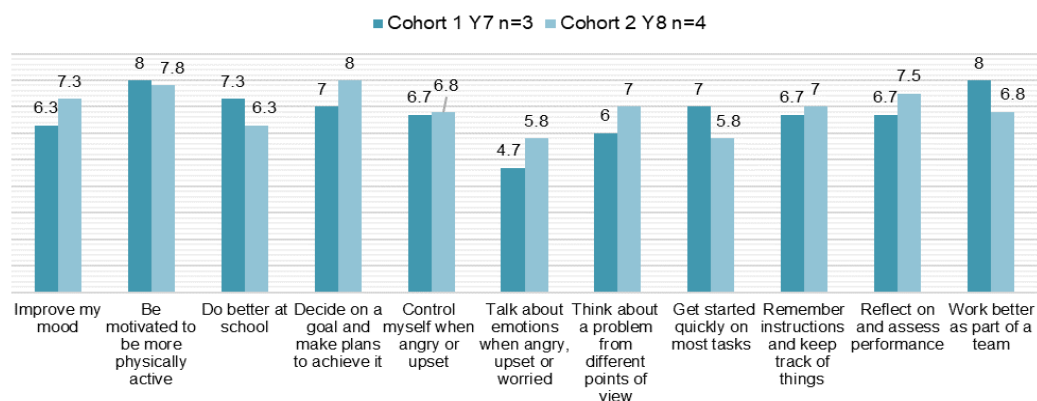
**Key findings for attention skills deployment (Cohort 1 only):**

- Both Cohort 1 and Cohort 2 students mostly practised selective attention skills: 73% in Cohort 1 and 93% in Cohort 2
- The students mostly deployed attention skills in:
  - English (30% in Cohort 1 and 27% in Cohort 2)
  - Mathematics (11% and 27%)
  - Geography and French (33% and 21%)
  - Science (5% and 2%)
- Students reported staying focussed on the work, avoiding distractions and not distracting others, thus underlining that their strategies were effective; they had made progress, did not let other people distract them, got more work done and learnt more.
- Just under half of the students (44%) reported at least once that a teacher has noticed and commented upon their attempts to stay focussed.

### Cognitive, emotional, social competencies and coping strategies

Students were asked the extent to which they agreed that SmartGym had helped in relation to cognitive, emotional, and social competencies and coping strategies (or SmartGym goals), using a 10-point scale (1=not at all to 10=completely). The overall average score for all 11 questions was almost the same for Cohort 1 (6.8) and Cohort 2 (6.9).

**Figure 3:** Improvement in SmartGym goals according to students (Cohort 1 + Cohort 2)



The improvement was similar for some questions but different for others (Figure 3). For both cohorts taken together, the greatest sustained improvement was for ‘be motivated to be more physically active’ and the least improvement for ‘talking about emotions when angry, upset or worried’.

Qualitative data from students reported positive impact of the SCRP as:

- A greater ability to focus and improved attention and concentration due to ignoring distractions.
- Feeling more relaxed due to being able to hit the CardioWall® pods to feel better.
- Feeling more confident as a consequence of the SCRP.

#### Key findings for cognitive, emotional, social competencies and coping strategies (Cohorts 1 & 2):

- The most improved competencies for Cohort 1 were ‘be motivated to be more physically active and “work better as part of a team’.
- The most improved competencies for Cohort 2 were ‘decide on a goal and make plans to achieve it’ and “be motivated to be more physically active’.
- Both Cohort 1 and Cohort 2 had the lowest average score for ‘talk about emotions when angry’.
- Baseline scores in Cohort 1 were all below 3.6 for the EFS. A decrease over time was expected, but three months after the last session, the data reported the five EFS still remained much improved (scores ranged from 4.7 – 7) when compared to the baseline five months earlier.

## Parents

Parents (cohort 1 n=3 / cohort 2 n=2) completed the survey at the same time as their child. They were asked about the extent to which the SCRP had helped in relation to cognitive, emotional, and social competencies and coping strategies (SmartGym goals) using a 10-point scale (1=not at all to 10=completely). Parents in Cohort 1 were also interviewed [n=2].

Only one parent reported that they had not observed any real improvement in behaviour or attitude of their child. The other parents reported an improvement in their child's attention skills and coping strategies and an ability to concentrate better and for longer and remember more information. Parents reported a perception that schoolwork and homework had improved, and their child more motivated to learn with better organisational skills and more confidence.

'He improved his concentration, and he is better at doing homework ... He is currently doing well at home and with his homework. ... There has been a massive improvement on how he is doing. He is able to work on his six daily lessons ... He is working much better than previously before he did SmartGym as his attention is better and for longer. His organisational skills have also improved' (Parent 1 Cohort 1).

### Key findings from parents:

- All Cohort 1 and Cohort 2 parents indicated that their child enjoyed and looked forward to the SCRP and CardioWall® activities.
- All but one parent reported that their child had made progress.
- Parents said the greatest improvements were in their child's mood and their motivation to be more physically active.
- Cohort 2 parents also reported 'talk about their emotions when angry' as most improved
- The least improved competency according to both Cohort 1 and Cohort 2 parents was 'get started quickly on most tasks'.

## Teachers

Interviews (n=1) and a survey (cohort 1 n=1/cohort 2 n=6) were conducted with teachers. Teachers reported that some students had improved more than others. Those most improved had increased their attention skills because they were able to utilise the competencies learnt during the SCRP. Some teachers provided feedback that some students were seen to be focusing better on the task at hand and that their selective attention had improved.

Teachers were asked to assess overall effectiveness of SCRP for improving competencies in students they taught, who took part in the programme, by ranking the 11 competencies in relation to the effectiveness in improving them. For general competencies, the ranking order was:

1. Improve mood and well-being
2. Improve resilience (a teacher-specific question)
3. Do better at school and improve behaviour

Some teachers commented favourably on the progress of students and how the SCRP had more of a positive impact for some students than others. Improving the ability to better manage emotions and feelings was also underlined as a benefit of SmartGym. Typical positive comments were:

*‘Super focus for sustained periods of work.’ (Art) (9/10)*

*‘Progressed very well and was focussed at all times, joining in with class discussions and helping others.’ (English) (10/10)*

*‘Worked hard to improve concentration and produced some nice work and was much calmer and much more polite and took on board warnings by altering behaviour.’ (Maths) (8/10)*

General trends in improvement were clear, but students’ performance appears likely to be linked to the academic subject or to a particular teacher, and each teacher may focus on different aspects of student behaviour and performance when assessing them:

*‘There have been some students that I teach where I have seen a significant improvement, others not so much.’*

*‘Some students have been much calmer at home and able to manage their feelings much better.’*

#### **Key findings from teachers:**

- Teachers said that students enjoyed the SCRP and especially the CardioWall® activities.
- The most improved students were better able to mobilise their selective attention skills and better able to manage emotions and feelings.
- The SCRP was most effective in improving mood and well-being and in helping students remember instructions and keep track of things.
- Teachers’ views about the worthwhileness of the SCRP were polarised and less consensual than the views of students and parents.
- They reported that some students improved a lot more than others and some not at all.



**Results for primary objective: what additional benefits and limitations of the programme have been identified?**

**Key points on benefits of the programme:**

- Students associated the CardioWall® with concepts of sport, games and competition, as well as self-regulation.
- Students identified benefits of the programme which were outside the core aims of the programme, such as being with friends, missing lessons and that the SCRП was 'fun'.
- Most parents identified better mood, a better ability to focus on the task at hand and a greater motivation to be more physically active.
- Teachers reported that SCRП had been used as an effective motivational tool in lessons, and that it had enabled better focus for getting the work done.
- Some teachers were enthusiastic about the potential of the CardioWall® in improving hand eye co-ordination, strength and cardio benefit, as well as perseverance skills.
- The school had already identified the students who took part in the pilot as either disengaged and failing to thrive at school, and hence potentially at risk of exclusion and /or as having social, emotional and mental health issues and a reluctance to access help.
- The SCRП demonstrated that it could engage many of these students in self-motivation and build their reflective capacity.
- This project highlighted the need for supporting teachers better to understand the impact of internal distress on a child's capacity to cope, with or without a diagnosis.
- The project highlighted the importance of the links between the mental health team, parents, and schools.

### Key points on limitations of the programme:

- Students reported that some teachers did not notice their efforts in practising attention skills (mentioned twice in interviews and by several students in the workbooks).
- Students reported not really knowing whether they had improved during lessons.
- A minority of students reported too much social interaction and when people kept interrupting the teacher who was talking.
- Students need more support to input data in their workbooks to enable better tracking progress and to maximise their potential to reflect on their progress.
- Some parents reported that the SCRP was too short and that it needed to continue, so their child could keep improving.
- Many teachers articulated a desire for a longer or more intense programme to maximise the benefit for students.
- A minority of teachers had negative views of the SCRP and that they had not seen any improvement in attention skills or behaviour in any student and believed that the SCRP was a reward for bad behaviour.
- Teachers need more support to understand how best to facilitate the progress of students who undertake the SCRP.



**Results for secondary objectives: what were the drivers and barriers, and pathway changes necessary to integrate the SCRP within the curriculum, pastoral care system, other MH initiatives and clinical pathways?**

#### **Key points on routine integration of the programme, barriers and drivers:**

- Students reported the SCRP model easy to understand and associated it with positive feelings.
- Teachers and parents who provided feedback unanimously agreed that the students really enjoyed the exercises on the CardioWall® and looked forward to the sessions.
- Over half of teachers who provided feedback believed that the SCRP was useful as a motivational tool for enhancing self-control and self-regulation, team-playing skills, and resilience to get students to focus better and be more 'switched on'.
- A small proportion of teachers felt that they had not seen any improvement in attention skills, or behaviour, and that students had not understood how to transfer their new skills into a classroom situation.
- Consideration should be given to a structured approach as to which students would benefit most from the programme. Teachers specified that students who were quiet and unconfident with low self-esteem, lacked focus or concentration, and struggled to keep still, were most likely to benefit from the SCRP.
- Not all the teachers may have understood the aims and objectives of the SCRP and may not have been clear about the actions they needed to perform to help optimise the benefits and effectiveness of the SCRP, such as praising and encouraging students for demonstrating small improvements.
- Parents and teachers need to be involved at the start of any future implementation of the programme, to maximise the benefit and improve experience.

## **Project conclusions**

### **What have we demonstrated?**

This project showed promising results and a good potential for the SCRP to become embedded in routine practice within the school. The programme was able to engage and motivate vulnerable school students. Students learned valuable key executive functioning skills and the school is keen to continue to deliver SmartGym sessions independently going forward, to continue to support these students and further cohorts.

During the SCRP, student well-being improved, in particular their energy, mood and fruit and vegetable intake. Most were motivated to do better at school with nearly half showing a substantial improvement in their ability to focus and avoid distractions. Several months after the end of the SCRP, the students who completed the survey indicated their greatest areas of improvement as

being their motivation to be more physically active, and their ability to decide on a goal and make plans to achieve it.

Within the rapidly changing context of the Covid-19 pandemic, the SCRP delivery model has shown to be flexible, adjustable and engaging for number of students, parents and more than half of the teachers who provided feedback. Some parents and teachers suggested that the SCRP delivery model should be adjusted to offer a higher dosage of the intervention (e.g. be longer and/or more intense).

The mixed-methods approach used a validated conceptual framework (NPT) to inform the analysis of this real-world evaluation, which had multiple perspectives (students, parents, and teachers) and a multiplicity of data collection instruments, from multiple time points, which provided valuable insights. Some of the insights from the SCRP and its evaluation will be of use to the school to better understand the perspective of students.<sup>9</sup>

The students who were referred to the SCRP were disengaged and did not thrive at school and could potentially have been at risk of exclusion and/or had emotional issues, low confidence and a reluctance to access help. Students in both cohorts underlined hyperactivity and concentration difficulties as main issues, followed by overall stress. The fact that some of these students reported positive changes sustained over a period of months is therefore significant.

It is worth noting that the pandemic may have impacted the results for both cohorts, but more so the second cohort. Some studies have found a substantial increase in anxiety among secondary school students<sup>26,27,28</sup> during the first wave of the pandemic and first national lockdown. Other studies indicate that, (except for those with pre-existing mental health conditions), anxiety and stress remained stable or only slightly increased for secondary students in the UK<sup>29</sup> or actually improved for a minority (10-15%) who had low well-being before the pandemic.<sup>30</sup>

Whilst a large-scale study of both primary and secondary school students has found that one third of the sample reported improved mental well-being.<sup>31</sup> However, all available studies agree that the second wave of the pandemic and second lockdown saw a significant decline in wellbeing, and an increase in anxiety in secondary school students, which was worse for those with pre-existing mental health issues.<sup>32,33,34</sup>

## Limitations of the evaluation

There are a few limitations that are acknowledged with data reported in this evaluation. Findings are reported on a small data set and therefore outcomes should be interpreted with caution. The evaluation of this programme has in part been able to identify outcomes but, due to Covid-19 restrictions, there were many gaps in the data to have been routinely collected in the workbooks, and separately from the workbooks, as part of the delivery of the SCRP, including student feedback. In addition, face to face planned structured focus groups with students, and interviews with staff, did not take place either in Cohort 1 or Cohort 2. Remote interviews with students and one member of school staff took place for Cohort 1, but neither interviews, nor focus groups, were possible for Cohort 2. This may have resulted in a lack of rich data to demonstrate a full understanding of the experiences of students and school staff.

<sup>9</sup> Such as trends within the baseline data for the Strength and Difficulties Questionnaire (SDQ) and Child Outcome Research Consortium Resilience survey (CORC) which are included in the full evaluation report (Matheson-Monnet CB (2021) *Independent evaluation of the piloting of the SmartGym programme in Newent Community School*. pp79 PURE ref 9164909. Southampton: Wessex Centre for Implementation Science/University of Southampton/Wessex Academic Health Science Network)

Students were chosen by the school to take part in the SCRP using a subjective process and purposive sampling. Greatest potential to benefit was the key criterion. Other criteria included not thriving, disengagement with school activities, social and emotional and mental health difficulties (but not already receiving support from CAHMS), inability to focus, negative behaviour points awarded in school by teachers, and the need to be inclusive in terms of gender and ethnicity. The sample included 15 boys and three girls, so was not a gender-balanced sample, but skewed toward boys. Cohort 1 were all boys but from a diversity of ethnic backgrounds. Cohort 2 included three girls and five boys. This could represent a form of selection bias, but the selection process was very complex and depended on multiple factors, including the child's wishes and parental consent.

Assessing the effectiveness of school-based targeted interventions in a secondary school setting is made more difficult due to the unknown impact of other interventions that are likely to be taking place. A further difficulty is that student lack of engagement or disruptive behaviour are rarely constant and consistent in all classes and with all teachers. Similarly, improvement may only be seen in some classes and with some teachers. This makes it more difficult to ascertain the impact of an intervention. Unless a longitudinal approach is taken, and student outcomes are compared over time, a full picture of impact is difficult to establish for real world evaluations in a school setting.

## Impact of Covid-19 on the project

The full impact of the originally planned SCRP delivery model cannot be ascertained, as the multiple Covid-19 disruptions will have impacted outcomes. Cohort 1 received a lower dosage than planned, with only 8/10 sessions delivered. Cohort 2 had 10 sessions over seven weeks, but many students did not attend all the sessions. Social school bubbles and social distancing in Cohort 2 resulted in the inability to have Year 10 SmartGym peer mentors, and little group activity, reducing the chance to learn about skills such as teamwork and communication. However, several positive consequences were noted due to Covid-19. Enforced changes demonstrated the adaptability of the SCRP, allowing for delivery once or twice a week, and for a rapid pivot to be run by remotely trained members of school staff - without the physical support of staff from Rugged Interactive and the Anna Freud National Centre for Children and Families.

The impact of the input from Year 10 peer mentors in Cohort 1 and the impact from the Train-the-Trainer approach in Cohort 2 are unknown. No data from Y10 peer mentors was collected in Cohort 1 and the structured focus groups to assess these two different approaches had to be cancelled due to the School being closed. However, students from Cohort 1 described in interviews the role of Y10 peer mentors as performing a variety of tasks to support their progress (helping them complete their workbooks, asking them questions, helping them think about what they were good at, and helping motivate and encourage them). The potential impact of the input from an Education Mental Health Practitioner (EMHP<sup>10</sup>) into the delivery of the sessions is unknown. Due to NHS staffing shortages, and then Covid-19 restrictions, no EMHP ever attended in Cohort 1 and, due to social restrictions within the school, no EMPH was planned for Cohort 2.

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<sup>10</sup> For further information about the EMHP role in schools: <https://ppn.nhs.uk/resources/careers-map/career/education-mental-health-practitioner>

## Learning points from the project

Lesson	Future learning	Who can take this forward?
The SCRCP has been delivered twice without being co-delivered with input from mental health teams or from an Extended Mental Health Practitioner as originally intended.	Since this project ran, the school has continued to make use of the SmartGym programme and the CardioWall® equipment with the pastoral care team. Further discussion is needed to understand how the SCRCP could embed within other mental health initiatives and clinical pathways, through facilitation of early identification and diagnosis of mental health problems.	Schools and mental health providers
The sustainability of SCRCP was demonstrated by the ability of the school to deliver it without the presence of SCRCP trainers & mentors.	The physical absence of SCRCP trainers in Cohort 2 demonstrated that the school could, if necessary, easily run the programme with school staff trained remotely (teacher and teaching assistants). This enabled the school to understand the benefits of the SCRCP even better than might otherwise have been the case with an uninterrupted programme.	Schools
The evaluation showed that there was a lack of clarity regarding the selection of students and that this could be a potential barrier to teacher buy-in, and therefore embedding the SCRCP in daily routine practice.	The criteria for selection in the programme may need some additional consideration to select those students most likely to engage and benefit from the programme, as well considering their vulnerability and need.	SCRCP innovator and schools
Not all participants were clear about the aims and objectives of the programme.	Induction sessions with parents, and especially teachers, are needed to align their expectations. In particular, the expectations of teachers who need to actively recognise even small improvements and praise students for their efforts, as the SCRCP is about incrementally building small changes.	Schools (pupils, teachers and parents)
Extended school closures and the small sample size impacted delivery and outcomes	Further evaluation would be useful to explore the longer-term impact in terms of the number of absences, suspensions and exclusions, and attainment, especially of disadvantaged students. In addition, given the expectation of incremental improvements over time, it may be valuable to assess the impact of the intervention over a longer period of time, and to explore whether the improvements seen are maintained.	SCRCP innovator and West of England AHSN

## Potential for the future and next steps

SmartGym is an example of “upstream working” – “a type of primary prevention that focuses on providing students with the life skills necessary to navigate situations and relationships, from which problem behaviours may arise” - identified in the Timpson Review <sup>35</sup> for reducing exclusions.

The results from this evaluation indicate that the SCRP could be a valuable tool for supporting students in developing key resilience skills, helping them improve executive function skills, building confidence and improving focus in class; potentially leading to a wider benefit to the school, through less disruption in a mainstream secondary, school-based setting.

It also demonstrates the potential value of a combined physical and mental health intervention, with students whom the school identified as most likely to benefit from it. This included those who were failing to thrive at school and could potentially be at risk of exclusion, and also those with a social, emotional, and mental health (SEMH) profile, who may be reluctant to access help and unlikely to access talking therapies.

This project has also identified a number of areas that would benefit from further exploration.

- The West of England AHSN Industry and Innovation team will continue to support Rugged Interactive Ltd and the AFC to further explore opportunities for:
  - Cost-benefit evaluation
  - Different commissioning models for this type of intervention
  - Further refining the SCRP value proposition and delivery model for schools
  - Further defining the post-programme support model for schools (see points below)
  - Development of a business case
- Based on the early success of this programme, Newent Community School and Sixth Form Centre will be running SCRP within other year groups. This is a promising and exciting result of the project, and Rugged Interactive and the AFC look forward to supporting the school as an ambassador for this initiative. The West of England AHSN will continue to take an interest in the development of this intervention and will be keen to hear longer-term feedback from the students, school staff and innovator.
- Follow up of the continued use of the CardioWall® within Newent Community School and Sixth Form Centre, including assessment of their management of equipment post-programme.
- Explore the feasibility of the SCRP, integrated within the PSHE curriculum, by way of universal upskilling of the student population, in managing their own wellbeing in targeted small groups or one-to-one for students struggling with complex emotions and life experiences.
- The original ambition for SCRP to be co-delivered by NHS staff and subsequently be part of a care pathway for students referred to the EMHP, could be explored further, as this was not possible during this evaluation. A meeting with NHS community delivery teams has taken place with plans for future co-operation.

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# The Future Challenges

## Young People and Mental Health: SmartGym

West of England Academic Health Science Network | [weahsn.net](http://weahsn.net) |  
[weahsn.contactus@nhs.net](mailto:weahsn.contactus@nhs.net) | 0117 900 2604



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