



# NHS Innovation Accelerator

## Economic Evaluation Case Study: ESCAPE-pain

### Summary

Enabling Self-management and Coping of Arthritic Pain through Exercise (ESCAPE-pain) is a six-week group programme delivered to people aged 45+ with osteoarthritis. The model of implementation considered in this case study is the commissioning by a CCG of a private sector leisure provider to deliver the programme, which is currently the preferred model. Costs of the programme are £149.33 per person. Benefits, based on the results of a randomised controlled trial (RCT) are estimated at £1,467 per person, based on total health and social care costs. This gives a return on investment ratio of 8.83, or £8.83 for every £1.00 spent on the programme. The data on input costs are taken from the current preferred delivery model, however the outcomes are interpreted from a different model. This has been done for illustration, but the outcomes may not be the same with a change in the implementation approach.

### 1. BACKGROUND

Around a third of people aged 45 years and over in the UK, a total of 8.75 million people, have sought treatment for osteoarthritis (OA) at some point. Around a fifth of the population consult their GP about a musculoskeletal condition each year. Almost half of these, some 4.71 million people in the UK aged 45 and over, have sought treatment for osteoarthritis of the knee. This indicates that, overall, around 18% of the current total population of people aged 45 and over have sought treatment for osteoarthritis of the knee at some point.<sup>1</sup>

---

<sup>1</sup> Arthritis Research UK (2013). Osteoarthritis In General Practice. Data and perspectives.

Enabling Self-management and Coping of Arthritic Pain through Exercise, ESCAPE-pain, is a rehabilitation programme for older people with knee and/or hip OA. The format, content and delivery of the ESCAPE-pain programme was designed and underpinned by theories about pain management and behavioural change. It is based on the theory that giving people information about their condition, and allowing them to experience the safety and benefits of exercise, would alter their beliefs about the value of exercise in controlling their problems, encouraging them to be more active, thereby enabling them cope with and self-manage their condition.

ESCAPE-pain is delivered in 12 sessions over six weeks. Each session combines education (the provision of information and advice), with active participation in an exercise regimen. The education component informs people about the causes of joint pain, gives practical advice about self-management and coping strategies, and challenges widely held erroneous attitudes, beliefs and behaviours related to exercise with joint pain. The exercise regimen involves participants undertaking a challenging, progressive programme of exercise tailored to each person's needs and capability.

A cluster randomised control trial demonstrated that ESCAPE-pain can help to reduce pain and improve physical function and mental wellbeing in participants.<sup>2</sup> It was also shown to reduce the use of primary care and outpatient physiotherapy.<sup>34</sup> Although these benefits declined over time, there were still measurable benefits from the programme up to 2.5 years after completing the programme.<sup>5</sup>

ESCAPE-pain is an established programme that has been delivered in various ways. One way has been to deliver the programme through NHS physiotherapy out-patient departments. However, logistical constraints (to do with exercise facilities and workforce, for example) and financial constraints, can severely limit the number of people who could benefit from the programme in this way. Delivering the programme directly in the leisure sector is an alternative approach, using established leisure centres and gyms, for example. However, this model faces difficulty in sustaining the necessary financing. As a result, the preferred model for delivery is for CCGs to commission the programme, paying leisure centres to provide ESCAPE-pain in their venues.

This analysis was developed in spring 2019 and was based on the information and evidence available at the time.

---

<sup>2</sup> Hurley MV, Walsh NE, et al. (2007) Clinical effectiveness of "ESCAPE(knee pain)" a rehabilitation programme for chronic knee pain: A cluster randomised trial. *Arthritis Care and Research*. 57:1211-1219.

<sup>3</sup> Hurley MV, Walsh NE, et al. (2007) Economic evaluation of "ESCAPE(knee pain)": A rehabilitation programme for chronic knee pain. *Arthritis Care and Research*. 57:1220-1229.

<sup>4</sup> Jessep SA, Walsh NE, et al. (2009) Long-term clinical benefits and costs of an integrated rehabilitation programme compared with outpatient physiotherapy for chronic knee pain. *Physiotherapy*. 95:94-102

<sup>5</sup> Hurley MV, Walsh NE, et al. (2012) Long term outcomes and costs of ESCAPE-knee pain: an integrated rehabilitation programme for chronic knee pain. *Arthritis Care and Research*. 64(2):238-47. doi: 10.1002/acr.20642.

The limitations of the analysis are as follows:

- Data on inputs has been taken from a proposed programme commissioned by a CCG, in which it is assumed that some of the costs are subsumed within the fee paid to the provider.
- Benefits are taken from a trial conducted in different circumstances (a physiotherapy department) to the model from which costs are taken; the results are expected to be equivalent to those of the trial, but this has not been established.
- The cost-reduction benefits in the trial were only apparent with the attribution of missing data.
- The input costs are taken from a single case, so there may be variation in how a programme is set up elsewhere, even using the same model.

## 2. INPUT COSTS

This case study is based on a current example, where a CCG has decided to commission a leisure provider to deliver ESCAPE-pain in the community. The CCG will pay the leisure provider a fixed rate per programme, which consists of 12 sessions over six weeks. The input costs for the example used here are set out in Table 2.1, based on the programme running for one year.

**Table 2.1: Inputs for ESCAPE-pain programme commissioned from a leisure provider for one year**

<b>Element</b>	<b>Metric</b>	<b>Value</b>
Commissioned programmes	Five programmes at £800 each	£4,000
Training for facilitators	Two facilitators at £300 each	£600
Promotional materials	£1,000 (nominal figure)	£1,000
<b>Total cost for one year</b>		<b>£5,600</b>

This calculation supposes that there is no new equipment to be bought by leisure centres and the costs of the use of leisure centres is subsumed into the fee paid by the CCG. It is not known how much might be spent on publicity (for example, posters placed in GP surgeries) so a nominal figure of £1,000 is used here.

Each ESCAPE-pain programme would recruit 10 participants. Based on an assumed drop-out rate of around 25%, reported by the programme developer,<sup>6</sup> this would result in 37.5 people completing the programme over the year, with a cost per person of £149.33.

---

<sup>6</sup> NIA Fellow. Personal communication.

### 3. OUTCOMES and ECONOMIC ANALYSIS

Evidence for an impact on outcomes comes from a cluster randomized, controlled trial.<sup>7</sup> The primary outcome for this trial was self-reported physical functioning, which was assessed using the physical function sub-score of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Higher WOMAC scores indicate worse pain, stiffness, and functional limitations.<sup>8</sup> Data on health care resource use were measured by interview, based on recall for the 6 months prior to each assessment point: baseline assessment; 6 weeks to 6 months; 6 to 18 months; and 8 to 30 months. A total of 418 participants were recruited, of which 375 (90%) were assessed on at least one follow-up occasion. Data were available on 283 participants (68%) at 30 months.

The results of the trial showed lower average, unadjusted WOMAC function scores immediately after the intervention for ESCAPE-pain participants (a reduction from 27.1 at baseline to 20.0 post intervention), compared to standard care participants (a reduction from 27.2 at baseline to 25.9 at the post intervention point). There continued to be a difference between the groups at subsequent assessments, although the difference between the groups reduced in size over time.

The use of total health and social care resources was £1,118 lower per person for the participants in the ESCAPE-pain group (at 2003/04 prices), compared to the standard care participants, over the full 30-month period. Although no difference was found in the data from participants, this difference was apparent when missing data was inputted. Using an indicator of inflation in the NHS, this is calculated to be £1,467 per person at 2019/20 prices, to make them comparable to the input costs, in the section above.<sup>9</sup> The per person and per cohort savings are presented in Table 3.1.

**Table 3.1: Savings from ESCAPE-pain programme commissioned from a leisure provider for one year (2019/20 prices)**

	Per participant (n=1)	For full cohort (n=37.5)
Cost of programme	£149.33	£5,600
Reduced health care use over 30 months	£1,467	£55,027
Net saving of programme	£1,318	£49,427

<sup>7</sup> Hurley MV, Walsh NE, et al. (2012) Long term outcomes and costs of ESCAPE-knee pain: an integrated rehabilitation programme for chronic knee pain. *Arthritis Care and Research*. 64(2):238-47. doi: 10.1002/acr.20642.

<sup>8</sup> [https://www.physio-pedia.com/WOMAC\\_Osteoarthritis\\_Index](https://www.physio-pedia.com/WOMAC_Osteoarthritis_Index)

<sup>9</sup> PSSRU. Unit Costs of Health & Social Care. 2010. Inflation indices. New Health Services Index, using HCHS up to 2007/08. Then PSSRU. Unit Costs of Health & Social Care. 2018. Inflation indices. New Health Services Index, using HCHS up to 2013/14. Then *ibid.*, using CPI (Health). 2018/19 & 2019/20 are estimated based on previous years.

On the basis of this case study, a return on investment (ROI) has been calculated using the formula:

$$\frac{\sum \text{Total discounted benefits} - \sum \text{discounted costs}}{\sum \text{Total discounted costs}}$$

This gives a result of:  $\frac{\pounds 49,427 - \pounds 5,600}{\pounds 5,600}$  ROI: 8.83

This is equivalent to £8.83 saved for every £1.00 spent on the ESCAPE-pain programme.

#### 4. CONCLUSION

This case study has evaluated the ESCAPE-pain for the scenario in which a CCG commissions a leisure provider to run the programme in its facilities. This is the preferred model for implementing the programme at present, due to challenges in financial sustainability for alternatives, and the inputs for this case study are based on a current real-world example. The analysis shows a substantial net benefit for the programme, with a strongly positive ROI.

An earlier economic evaluation of ESCAPE-pain, based on a Randomised Controlled Trial, used intervention costs of £224 per person, with the same benefit of £1,118 per person (as a result of lower use of health care resources, at 2003/04 prices).<sup>10</sup> In that earlier evaluation, ESCAPE-pain was provided in physiotherapy departments, rather than in leisure facilities, as here, which explains the difference in intervention costs. At that time, ESCAPE-pain was also provided as an individual intervention, as well as in group sessions. The providers no longer recommend its use as an individual intervention, which will keep intervention costs per person at a lower level.

The programme does not require the use of specialised equipment. The exercises are not sophisticated and the training for facilitators is not overly specialised. A consequence of this is that it can be easily replicated and can be provided in a variety of settings, including different kinds of leisure centre, as well as physiotherapy departments.

This case study considers the use of ESCAPE-pain for knee pain related to OA. It is also used for OA-related hip pain. No evidence has so far been generated for the input costs and economic benefits related to its use with patients experiencing hip pain. As a result, only knee pain-related use is included here. We understand that a new version of ESCAPE-pain is being developed for use with back pain.

The trial results used for this case study and the earlier evaluation showed that, with unadjusted results data, which ignores baseline values and missing data, there was no difference in the value of resources used between the intervention group and the control group. The difference became apparent only with the attribution of missing data. This was because there was differential drop-out from the intervention and control group, with the drop-out from the control group including participants with the highest health and social care costs and the poorest function scores, which were considered to be outliers.

---

<sup>10</sup> Public Health England. 2017. Return on Investment of Interventions for the Prevention and Treatment of Musculoskeletal Conditions. Report of Literature Review.

As previously mentioned, there are some limitations within the analysis, relating to using benefits data from a different mode of implementation of the programme, along with input data in which some costs are assumed to be incorporated in a flat fee. In addition, the cost-reduction benefits in the trial were only apparent with the attribution of missing data. The cost data were taken from a single example, which may not be representative of other cases of implementation of the same model. Any assumptions have been clearly stated.

York Health Economics Consortium, July 2019

## Glossary

Term	Description
Return on investment	Return on investment (ROI) measures the amount of return on a project relative to its cost. An ROI is calculated by subtracting the incremental costs from the value of the incremental benefits, and dividing the result by the incremental costs. The result is expressed as a percentage. For example, if the ROI is 100%, there will be a return of £1 for every £1 spent on the intervention.
Incremental	The incremental costs and benefits of an intervention are those that would not otherwise have occurred in the absence of the intervention.
Cost-benefit analysis	Cost-benefit analysis is a comparison of interventions and their consequences in which both costs and resulting benefits (health outcomes and others) are expressed in monetary terms. This enables two or more treatment alternatives to be compared using the summary metric of net monetary benefit, which is the difference between the benefit of each treatment (expressed in monetary units) less the cost of each.
Cost-effectiveness analysis	Cost-effectiveness analysis evaluates the effectiveness of two or more treatments relative to their cost. Interventions that are both more effective at producing health benefits than other interventions, and are associated with net cost savings (i.e. the additional cost of the intervention is outweighed by the cost savings elsewhere) are said to be a “dominant” strategy.
Cost-consequence analysis	Cost-consequence analysis compares the costs (such as treatment and hospital care) and the consequences (such as health outcomes) of a test or treatment with a suitable alternative. Unlike cost-benefit analysis or cost-effectiveness analysis, it does not attempt to summarise outcomes in a single measure (such as the quality-adjusted life year) or in financial terms. Instead, outcomes are shown in their natural units (some of which may be monetary) and it is left to decision-makers to determine whether, the treatment is worth carrying out”.
Cost-minimisation analysis	Cost minimisation analysis is a method of comparing the costs of alternative interventions which are known to have an equivalent effect. This type of analysis can be used to determine which of the alternatives provides the least expensive way of achieving a specific health outcome for a population.