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Cost-effectiveness of a model consultation to support self-management in patients with osteoarthritis

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ABSTRACT

Objectives: The aim of this study was to estimate the cost-effectiveness of a model OA consultation for osteoarthritis to support self-management compared with usual care.

Methods: An incremental cost-utility analysis using patient responses to the 3-level EQ-5D questionnaire was undertaken from a UK National Health Service perspective alongside a two-arm cluster-randomised controlled trial. Uncertainty was explored through the use of cost-effectiveness acceptability curves.

Results: Differences in health outcomes between the model OA consultation and usual care arms were not statistically significant. On average, visits to the orthopaedic surgeon were lower in the model OA consultation arm -0.28 (95% CI: -0.55, -0.06). The cost-utility analysis indicated that the model OA consultation was associated with a non-significant incremental cost of £-13.11 (95% CI: -81.09, 54.85) and an incremental QALY of -0.003 (95% CI: -0.03, 0.02), with a 44% chance of being cost-effective at a threshold of £20,000 per QALY gained. The percentage of participants who took time off and the associated productivity cost was lower in the model OA consultation arm.

Conclusion: Implementing NICE guidelines using a model OA consultation in primary care does not appear to lead to increased costs, but health outcomes remain very similar to usual care. Even though the intervention seems to reduce the demand for orthopaedic surgery, overall it is unlikely to be cost-effective.

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Keywords: Primary care, cost-effectiveness, NICE osteoarthritis guidelines, ICECAP, EQ-5D, implementation.

Key messages

- ~~A model OA consultation offers a practical approach that supports self-management of OA.~~
- Implementing NICE guidelines using a model OA consultation in primary care does not appear to lead to increased costs.
- The model OA consultation appears to reduce referrals to orthopaedic surgery, and may result in less time off work.
- The model OA consultation is unlikely to be cost-effective

INTRODUCTION

Osteoarthritis (OA) is most prevalent in older people and is known to adversely affect quality of life [1-3]. Estimates from the USA suggest that 12.4 million adults over the age of 65 are living with this condition and around 2.9 million people have a disabling form of OA. A report by the Royal College of General Practitioners indicates that about 1 million adults consult with symptoms of OA in a year and it is one of the main reasons why people seek medical care [4-6]. The total healthcare cost of OA has been estimated at £1 billion in the UK [5]. Therefore OA places a considerable burden on scarce health care resources. The proportion of older people in the population has been increasing over time [7], and with this ageing population, it is expected that the prevalence of conditions such as OA will rise. A number of published guidelines have been developed to aid the treatment and management of OA [8-12]. In the UK for example, the National Institute for Health and Care Excellence (NICE) recommend that patients with OA should be offered core treatments when they first present in primary care. These include education and access to information, advice on local muscle strengthening exercise and general aerobic fitness, and if appropriate, advice on losing weight [12]. However, there is a gap between the care that is recommended and that which patients actually receive and that the core aspects of assessment and management of OA currently delivered in primary care do not meet the recommendations of these guidelines [13-14]. Therefore measures need to be put in place to ensure that resources are used optimally. Consequently, there was a need to develop a practical approach that could potentially support self-management of OA and also aid the implementation of the core NICE guidelines for OA. This led to the development of a model OA consultation [15] for older patients presenting with peripheral joint pain, and training for health care professionals to support its delivery. The model OA consultation integrated core recommendations from NICE and consisted of: an OA guidebook written by patients and health professionals for

patients, an enhanced initial consultation with a GP, and subsequent follow-up with a practice nurse (up to 4 consultations) in a dedicated nurse-led OA clinic. In addition a practice e-template was developed to record quality measures of care derived from a systematic review of quality indicators for OA [15-16]. The Management of OsteoArthritis in Consultations (MOSAICS) trial compared the model OA consultation with usual care over a 12 month period. This paper reports the economic evaluation alongside the MOSAICS trial to assess the cost-effectiveness of the model OA consultation compared with usual care in patients who consult with OA.

METHODS

The economic evaluation was conducted alongside a two arm prospective pragmatic cluster randomised controlled trial in eight general practices in Cheshire, Shropshire or Staffordshire, UK. The protocol has been previously published [15]. The eight practices were randomised to receive either the model OA consultation or usual care (control). Additional details of the intervention can be found in appendix 1. The study was approved by the North West 1 Research Ethics Committee, Cheshire (REC reference: 10/H1017/76) and was monitored by an Independent Trial Steering Committee and Data Monitoring Committee (Trial registration number ISRCTN06984617). The primary outcome measure for the trial was the SF-12 physical component score [17].

The health economic analysis initially took the form of a cost-consequence analysis where a description of all the important results relating to costs and consequences (clinical outcomes, EQ-5D, SF-6D, ICECAP-A) were reported. Subsequently, an incremental cost-utility analysis using the quality adjusted life year as an outcome measure was undertaken from a UK National Health Service (NHS) perspective.

Data Collection

Resource Use and Costs

Information on resource use and time off work due to joint problems were collected from the postal MOSAICS consultation questionnaires completed by participants at 6 months and 12 months follow-up. NHS costs included primary and secondary care contacts, investigations, medication and contacts with other health care professionals such as physiotherapists and occupational therapists. Questions on participant's personal expenditure focused on private health care use and over-the-counter treatments [15].

In order to value resource use, unit costs were obtained from standard sources such as the Unit Costs of Health and Social Care [18], the British National Formulary [19] and NHS Reference Costs [20] and applied to resource use data. Due to the lack of nationally representative unit cost estimates for private health care, this care was costed as the NHS equivalent. To obtain the cost of the model OA consultation, information on the resources used to deliver the intervention were obtained from patient records collected throughout the trial. To generate the intervention cost, we obtained records collected as part of the intervention. These records showed that the average number of times that trial participants actually saw their nurse from available records was 2.3 times. We therefore made the assumption that everyone in the intervention arm who actually saw the nurse did so at least 2.3 times. GP costs were not included as part of the intervention since all participants, irrespective of trial intervention arm received usual care. Costs associated with over the counter medication were based on participant responses to the postal questionnaires. Unit costs of the resource use items are presented in appendix 2 and are in 2012/2013 prices.

Health and Quality of Life Outcomes

All participants completed the 3-level version of the EuroQoL-5D (EQ-5D) questionnaire [21] at baseline, 3, 6 and 12 months. EQ-5D index scores were generated using the UK value

set [22] to calculate quality adjusted life years (QALYs) over the 12 month period which was used in the base case analysis. (The QALY is an outcome measure that takes both the quality and quantity of life associated with an intervention into account). Participants also completed the SF-12 questionnaire [17] which was used to generate SF-6D scores [23] and the ICECAP-A questionnaire at baseline, 3, 6 and 12 months. The ICECAP-A is a measure of capability for adults, which aims to capture an individual's freedom to function in five key areas of their life: attachment, autonomy, enjoyment, stability and achievement [24].

Statistical Analysis

Descriptive statistics were used to summarise the main health economic outcomes (EQ-5D 3L, SF-6D and ICECAP-A). The cost-utility analysis was focused on determining the difference in costs and QALYs between the model OA consultation and usual care arms. To ensure all eligible participants were included in the study, missing EQ-5D, SF-6D, ICECAP-A and costs were imputed using multiple imputation methodology [25]. An imputation model was fitted and included 25 imputed dataset. Using EQ-5D scores, QALYs over a 12 month time period were calculated for each study participant with the area under the curve method [26]. Imbalances in baseline utility (EQ-5D) scores between the model OA consultation and usual care arms were controlled for using a multiple linear regression approach [27]. Mean costs associated with each trial arm were estimated, and due to the skewed nature of the costs, the difference in mean costs and 95% confidence intervals were calculated using non-parametric bootstrapping [28]. Net monetary benefit ($\Delta E^{*}\lambda - \Delta C$) was also estimated for each participant. This is defined as the change in effectiveness/QALYs (ΔE) multiplied by the cost-effectiveness threshold (λ) minus the change in cost (ΔC) [29]. The threshold value (λ) used for the estimation of net benefits was £20,000 per QALY.

The base case took the form of a cost-utility analysis from a National Health Service (NHS) perspective and was conducted using multilevel linear modelling (as participants are

clustered within GP practices), a method that has been recommended for the economic evaluation of cluster trials [30]. The dependent variables were net monetary benefits, costs, QALYs and cost of work absence. Independent variables included gender and baseline EQ-5D. Model estimates of the difference in costs, QALYs and net monetary benefits were used to derive an incremental cost per QALY gained and an incremental net monetary benefit.

Uncertainty was explored through the use of cost-effectiveness planes and cost-effectiveness acceptability curves (CEACs); these plot the probability that the intervention is cost-effective against willingness to pay threshold values [31]. All analyses were carried out in STATA 12, Realcom and Microsoft Excel [32-34]. Discounting was not required as the follow up period was 12 months.

Sensitivity Analysis

The sensitivity analysis had two main foci. The first was to explore uncertainties in the trial based data by using QALYs generated from the SF-6D to obtain cost-effectiveness estimates. The second was to explore broader societal costs through the inclusion of private health care costs e.g. over the counter medication costs and private health care utilisation costs as well as productivity costs. The human capital approach [35], was used to estimate productivity costs using data collected on employment status at every time point and days off work due to their health. The average wage for each respondent was identified using UK Standard Occupational Classification coding and annual earnings data for each job type [36].

RESULTS

A total of 525 participants across the 8 randomised practices were recruited to the cluster trial. Of these, 288 participants were in the practices randomised to the model OA consultation arm and 237 in practices randomised to the usual care arm. The mean age across all patients was 67.3 years (SD 10.4) and 59.5% were female. Follow-up rates at 6 and 12

months were 424 (81%) and 384 (73%) respectively in the intervention and control arms. A total of 305 (58.1%) participants provided complete EQ-5D data at all time points.

Resource use

Primary care visits were generally higher in the usual care arm. Although the differences were not statistically significant, participants in the usual care arm had more visits to both the GP and nurse. There was no significant difference in secondary care visits between trial arms with the exception of visits to the orthopaedic surgeon which was significantly higher in the usual care arm. Approximately 65% of participants in the usual care arm had prescribed medication as compared to 59% in the model OA consultation arm (Table 1).

Health Outcomes

Mean EQ-5D and SF-6D scores increased at all time points over the 12 month period in both the intervention and usual care arms indicating an improvement in health status over time. Although these scores were higher in the usual care arm, the differences were not statistically significant. When total QALYs were estimated, the usual care arm was associated with marginally higher overall QALYs (in respect to both the EQ-5D and SF-6D). Also, the results for the between-group differences in ICECAP-A showed similarly that the usual care arm showed slightly higher average levels of capability across follow-up (Table 2). EQ-5D scores were generally lower than SF-6D scores at all times.

Costs

Overall NHS and health care costs were also higher in the usual care group compared with the model OA consultation arm. However, these differences were not statistically significant (Table 3). Table 3 also gives a breakdown of costs for each intervention. Use of primary and

secondary care, including visits to the orthopaedic surgeon, was greater in the usual care arm leading to higher costs.

Cost-effectiveness

Estimates from the regression model show that the intervention was associated with a lower cost (p=0.705) and fewer QALYs (p=0.786) (Table 4). At a willingness to pay threshold of £20,000 per QALY, the model OA consultation was associated with a 44% chance of being cost-effective (Figure 1).

Sensitivity Analysis

When broader health care costs were used, the intervention was still less costly (p=0.768) and less effective (p=0.786) than the usual care arm (Table 5). Cost-utility analysis with QALYs generated from the SF-6D yielded similar results to the base case analysis i.e. the intervention was less costly (p=0.705) and less effective (p=0.187) than the usual care (Table 5). A total of 136 participants were in full time employment at baseline. Of these, 40 participants, 20 in each trial arm took time-off over the 12 month period. Those in the intervention arm had fewer mean days off work than those in the usual care arm (p=0.364). The associated productivity related cost was lower in the intervention arm but the difference was not statistically significant (Table 5).

DISCUSSION

Summary of main findings

This study sought to assess the cost-effectiveness of the model osteoarthritis consultation (model OA consultation) for the implementation of NICE guidelines and support for self-management of osteoarthritis in primary care. Our results reveal that there was a general increase in health status across the whole population as measured by the EQ-5D and SF-6D

over the 12 month period, and although scores were slightly higher in the usual care arm, the difference was not statistically significant. SF-6D scores were higher than EQ-5D scores, a result which was in line with a previous study [37]. With the exception of visits to the orthopaedic surgeon, which was higher in the usual care group, there were no significant differences in all other secondary care resource use items between the trial arms. Participants in the usual care arm also reported more time-off work compared to the intervention arm. The finding that the intervention may lead to reduced referrals and less time off work suggests a possible avenue for future research to identify individual patients who might benefit from the approach.

The model OA consultation was less expensive than usual care and although this was not statistically significant, one might argue that the exclusion of the cost of training resulted in this lower cost. However, it should be noted that there are difficulties associated with the estimation of a per patient training cost within economic evaluation studies and also training received would be used for a large number of patients over a number of years, resulting in a low mean cost per patient.

The cost-utility analysis showed that the model OA consultation was less costly but less effective than usual care. Even though these differences are not statistically significant, the established approach that is used in health economics is to conduct a cost-effectiveness analysis, focussing on the joint estimation of costs and outcomes [38]. At a cost-effectiveness threshold of £20,000 per QALY, the probability of the model OA consultation being cost-effective was low at 44%.

Strengths and weakness of the study

A major strength of this study is that it is the first to consider the cost-effectiveness of the model OA consultation for the implementation of NICE guidelines and support for self-

management of OA in primary care. Second, the study considered cost-effectiveness in a population consulting with peripheral joint pain and OA in primary care. Much of the cost-effectiveness studies for OA are based on studies of knee OA and as such, our study considered a population where evidence of cost-effectiveness is lacking. Third, this study considered multiple outcomes and also considers outcomes broader than just health related quality of life which makes it unique from other health economic evaluations which consider a single outcome measure. This study is also associated with some limitations. First is the fact that the main outcome for the health economic analysis was the 3-level EQ-5D which may not be sensitive to changes in this disease area [39]. The five level version of the EQ-5D [40] is now available and this is likely to be more sensitive to change. Second, the difficulty associated with the estimation of a per patient training cost led to the exclusion of this cost from the analysis.

Meaning of the study

Implementing NICE guidelines using a model OA consultation in primary care may not lead to increased costs. Although the intervention may support some people with OA to remain in work and reduce the demand for orthopaedic surgery, overall it is unlikely to be cost-effective.

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Conflict of interest statement

The authors declare no conflicts of interest

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TABLE 1: Resource Use over 12 months Complete cases. All figures are means (standard deviations) except where indicated

Resource use category	Model OA consultation (n=199)	Usual care (n=155)	Difference (Bootstrapped 95% Confidence Interval)
Primary Care visits [a]	1.52 (2.46)	1.99 (3.38)	-0.48 (-1.18, 0.13)
GP at practice	1.32 (2.11)	1.59 (2.62)	-0.28 (-0.78, 0.24)
GP at home	0.02 (0.12)	0.01 (0.08)	0.01 (-0.11, 0.03)
Nurse at practice	0.19 (0.67)	0.39 (1.29)	-0.20 (-0.48, -0.01)
Nurse at home	0	0.01 (0.08)	-0.01 (-0.03, 0)
Other healthcare professionals (attached to practice) [d]	0.21 (0.86)	0.32 (1.15)	-0.12 (-0.33, 0.11)
Secondary care visits [b]	1.11 (2.65)	1.43 (2.91)	-0.32 (-0.96, 0.27)
Orthopaedic surgeon	0.34 (0.89)	0.58 (1.37)	-0.24 (-0.52, -0.003)
Podiatrist	0.13 (0.92)	0.12 (0.80)	0.003 (-0.17, 0.17)
Physiotherapist	0.61 (2.01)	0.65 (1.93)	-0.04 (-0.47, 0.36)
Occupational therapist	0.04 (0.21)	0.07 (0.58)	-0.04 (-0.16, 0.04)
Other secondary care visits [d]	0.16 (0.91)	0.10 (0.51)	0.06 (-0.07, 0.24)
Private consultants [c]	0.39 (1.66)	0.57 (3.07)	-0.18 (-0.79, 0.29)
Private other health care professionals [d]	0.13 (0.85)	0.04 (0.28)	0.09 (-0.02, 0.23)
Hospital investigations/treatments [d,e]	82 (41.21%)	72 (46.45%)	10
Prescribed drugs [d,e]	117 (58.79%)	101 (65.16%)	16
Over the counter drugs [d,e]	98 (49.25%)	72 (46.45%)	26

[a] Includes contacts with GP and Nurse at home and practice [b] Includes contacts with physiotherapists, occupational therapists podiatrists, and orthopaedic surgeons [c] Includes contacts with private physiotherapists, occupational therapists private podiatrists and private orthopaedic surgeons [d] Patient-specific [e] Figures are the

number of patients (percent) who stated that they had a investigation or a drug presented in this table were solely obtained from self report questionnaires ** Resource use items*

TABLE 2: Health Outcomes Mean (SD) over 12 months (imputed analysis)

	Model OA consultation (n=288)	Usual care (n=237)	Difference (Bootstrapped 95% Confidence Interval)
EQ-5D scores			
Baseline	0.573 (0.298)	0.588 (0.272)	-0.015 (-0.062 , 0.039)
Month 3	0.615 (0.280)	0.631 (0.264)	-0.016 (-0.064 , 0.030)
Month 6	0.637 (0.264)	0.638 (0.259)	-0.001 (-0.044 , 0.044)
Month 12	0.651 (0.262)	0.674 (0.224)	-0.023 (-0.067 , 0.018)
QALYs	0.627 (0.244)	0.639 (0.224)	-0.012 (-0.054 , 0.026)
QALYs[a]	0.632	0.634	-0.002 (-0.25, 0.020)
QALYs[b]			-0.003 (-0.026 , 0.197)
SF 6D scores			
Baseline	0.678 (0.139)	0.690 (0.148)	-0.012 (-0.037 , 0.013)
Month 3	0.688 (0.141)	0.696 (0.141)	-0.008 (-0.033 , 0.017)
Month 6	0.687 (0.142)	0.707 (0.144)	-0.020 (-0.044 , 0.004)
Month 12	0.693 (0.139)	0.702 (0.138)	-0.009 (-0.032 , 0.015)
QALY	0.688 (0.128)	0.701 (0.129)	-0.013 (-0.038 , 0.010)
QALY[a]	0.692	0.696	-0.004 (-0.03, 0.01)
QALYs[b]			-0.012 (-0.03 , 0.01)
ICECAP A			
Baseline	0.826 (0.166)	0.851 (0.155)	-0.025 (-0.053 , 0.003)
Month 3	0.828 (0.151)	0.853 (0.155)	-0.025 (-0.053 , 0.001)
Month 6	0.821 (0.160)	0.843 (0.158)	-0.022 (-0.049 , 0.005)
Month 12	0.837 (0.153)	0.846 (0.155)	-0.009 (-0.038 , 0.014)

[a] *adjusted for baseline Utility* [b] *difference in QALYs between trial arms adjusted for baseline Utility and gender (Regression model)*

TABLE 3: Mean per patient costs (SD) over 12 months (£)

Resource use category	Model OA consultation	Usual care	Difference (Bootstrapped 95% Confidence Interval)
	n=199 (£)	**n=155 (£)**	
Primary Care visits [a]	56.01 (83.53)	69.02 (103.31)	-13.01 (-35.24, 5.28)
GP at practice	44.76 (71.80)	54.18 (89.01)	-9.42 (-29.03, 7.41)
GP at home	0.81 (6.55)	0.35 (4.31)	0.46 (-0.71, 1.55)
Nurse at practice	2.11 (7.46)	4.61 (15.07)	-2.49 (-5.50, -0.03)
Nurse at home	0	0.15 (1.87)	(-0.54, 0)
Other primary care visits [c]	8.33 (24.20)	9.74 (29.72)	-1.41 (-7.37, 3.97)
Secondary care visits [b]	60.68	76.48 (156.38)	-15.80 (-51.40, 14.01)

	(130.42)		
Orthopaedic surgeon	27.09 (71.66)	44.31 (106.94)	-17.22 (-37.95, 1.18)
Podiatrist	5.32 (35.65)	4.34 (26.23)	0.98 (-5.03, 7.93)
Physiotherapist	21.55 (77.01)	21.74 (70.72)	-0.18 (-15.47, 16.50)
Occupational therapist	2.06 (11.98)	2.24 (16.93)	-0.18 (-3.50, 2.61)
Other secondary care visits [c]	4.67 (17.85)	3.85 (22.67)	0.81 (-4.45, 4.65)
Hospital investigations/treatments [c]	109.71 (401.16)	92.36 (222.66)	17.35 (-42.40, 83.75)
Prescribed drugs [c]	15.51 (20.34)	15.65 (21.47)	-0.14 (-4.58, 3.86)
Trial intervention cost	11.47 (20.69)	0	11.47 (8.69, 14.42)
Over the counter drugs [c]	27.14 (255.67)	27.93 (121.01)	-0.79 (-31.51, 50.14)
Private health professionals [c]	21.62 (76.54)	29.53 (135.05)	-7.91 (-39.24, 12.24)
Imputed analysis			
	Model OA consultation (n=288)	**Usual care (n=237)**	**Difference (Bootstrapped 95% Confidence Interval)**
Total NHS costs [d]	227.17 (411.84)	236.11 (345.35)	-8.94 (-71.79, 57.70)
Total Healthcare costs [d]	278.56 (535.43)	285.99 (400.43)	-7.43 (-76.41, 76.26)

[a] Includes contacts with GP and Nurse at home and practice [b] Includes contacts with physiotherapists, occupational therapists etc [c] Patient-specific [d] Unadjusted costs

TABLE 4: Base case Cost-utility analysis (Imputed analysis)

	Difference in mean (Intervention-control)[b]	**P-value**	**Confidence Interval**	**Interpretation**
NHS costs (£) [a]	-13.11	0.705	-81.09, 54.85	Intervention less costly and less effective.
QALYs [a]	-0.003	0.786	-0.03 , 0.02	
Net monetary benefits (£) [a]	-33.63	0.887	-497.56, 430.30	

[a] adjusted for baseline Utility and gender [b] Difference in mean per patient cost and QALYs between trial arms

TABLE 5: Sensitivity analysis

	Difference in mean (Intervention-control)[b]	**P-value**	**Confidence Interval**	**Interpretation**
Cost-utility analysis with SF-6D				
NHS costs (£) [a]	-13.11	0.705	-81.09, 54.85	Intervention less

QALYs (SF-6D)[a]	-0.012	0.187	-0.03 , 0.01	costly and less effective.
Net monetary benefits (£) [a]	-178.39	0.362	-561.74 , 204.96	
Cost-utility analysis with Health care costs				
Health care costs (£) [a]	-14.14	0.768	-108.08, 79.80	Intervention less costly and less effective
QALYs [a]	-0.003	0.786	-0.03 , 0.02	
Net monetary benefits (£) [a]	-34.95	0.883	-501.82 , 431.92	
Time off work and productivity costs				
Number of days off over 12 months [a]	-1.05	0.364	-3.35, 1.23	
Mean cost (£) of work absence [a]	-23.25	0.845	-256.32, 209.83	

[a] adjusted for baseline Utility, and gender (Regression model) [b] Difference in mean per patient costs net benefits, QALYs and time off work between trial arms

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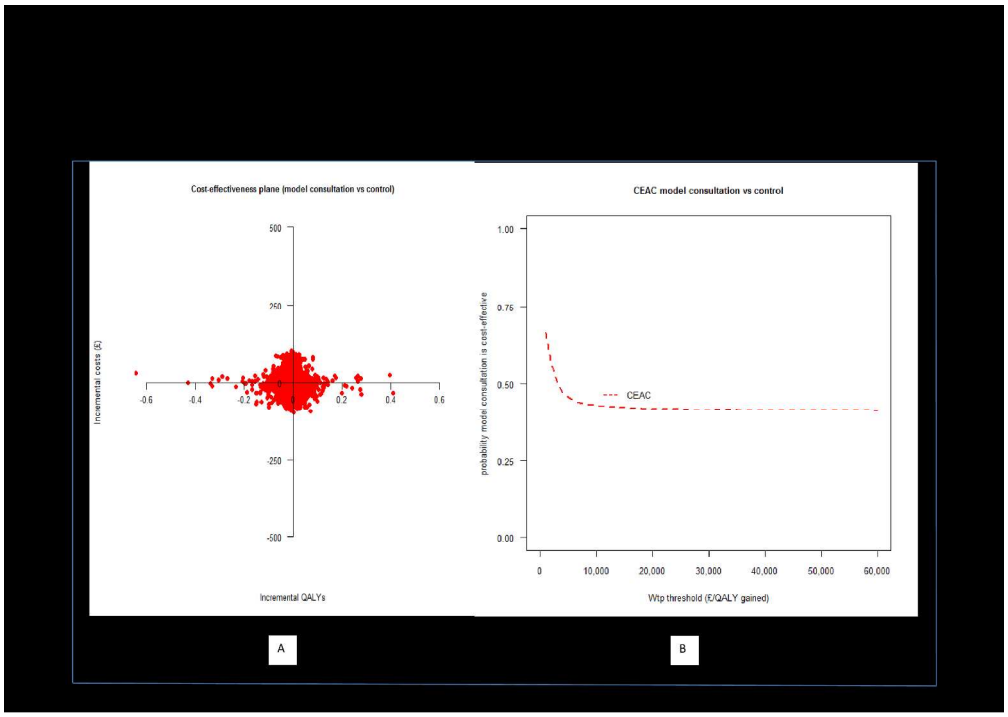

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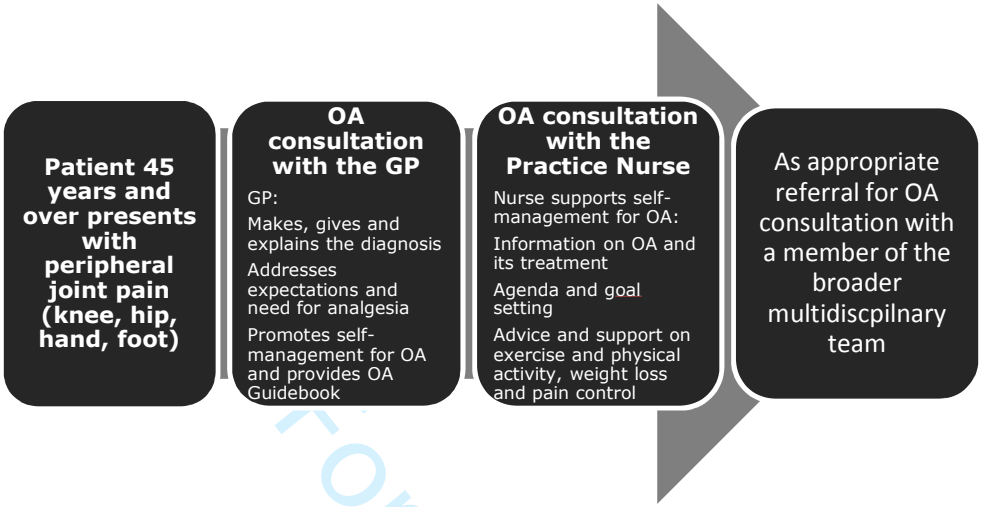
Appendix 1: The model OA consultation



Model OA consultation with the GP

Patients with peripheral joint pain who were aged 45 years and over had an initial consultation with the GP where an OA e-template was triggered as part of the consultation and GPs were asked to assess and make a clinical diagnosis of the problem without the routine use of x-ray. GPs were then asked to offer an explanation of OA (in suitable language and tailored to the patient's level of understanding and individual circumstances) and offer first line analgesia as appropriate (paracetamol; Topical NSAIDS). An OA guidebook (weblink:http://www.keele.ac.uk/media/keeleuniversity/ri/primarycare/pdfs/OA_Guidebook.pdf) written by patients and health care professionals for patients was given to the patient. It offers support for self-management, promotes the NICE core treatments and provides accounts of how people live with OA. The GP was then asked to explain the next steps: for the patient to read the OA guidebook and to arrange a follow-up appointment with the practice nurse.

Model OA consultation with the Practice Nurse (nurse-led OA clinic)

The timing of the first appointment with the practice nurse was planned for a minimum of two weeks after the initial GP consultation. This gave patients time to read the guidebook and try those self-management strategies they felt were suitable. In the first consultation the practice nurse was asked to

refer to the guidebook as a resource to answer questions and clarify issues, ascertain the advice from the GP consultation, negotiate and agree appropriate goals, discuss the need for pain relief and opportunities for healthy eating, physical activity and exercise as appropriate.

The timing of up to three follow-up visits with the nurse was agreed between the patient and the practice nurse, but was scheduled to be delivered within three months following the GP consultation. The follow-up practice nurse consultations were tailored to the patient's individual needs and could focus on, for example, reviewing the self-management plan, demonstrating exercises (Arthritis Research UK Exercises for Arthritis leaflet), giving advice as to how this could be maintained longer-term or making any necessary referrals to the broader multidisciplinary team. The practice nurse consultations were supported by a specifically tailored Case Report Form (available on request) and a nurse toolkit that included advice leaflets to give to patients (content of the toolkit available on request).

Appendix 2: Unit Costs (£) (2012/2013 prices)

Resource Use	Unit costs~~Source~~
Primary Care visits [a]	
GP visits per 11.7 minutes	34
Nurse visits at practice per hour	44
Nurse visits at home per hour	60
Other healthcare professionals (attached to practice)	Participant-specific
Secondary care visits [b]	
Orthopaedic surgeon	128
Orthopaedic surgeon (follow-up)	102
Physiotherapist	49
Physiotherapist (follow-up)	44
Occupational therapist	75
Occupational therapist (follow-up)	34
Podiatrist	74
Podiatrist (follow-up)	41
Other secondary care visits	Participant-specific
Private consultants	Costed to the NHS equivalent
Private other health care professionals	Costed to the NHS equivalent
Hospital investigations/treatments	Participant-specific
Prescribed drugs [c]	Participant-specific
Over the counter drugs	Participant-specific

[a] Curtis L Unit Cost of Health and Social Care 2013 PSSRU [b] NHS Reference costs schedule 2012/2013, [c] British National Formulary