

Putting NICE guidance into practice

Costing tool: Osteoarthritis

Implementing the NICE guideline on osteoarthritis (CG177)

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This costing report accompanies the clinical guideline [Osteoarthritis: care and management in adults](#)

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This report is written in the following context

This report represents the view of NICE, which was arrived at after careful consideration of the available data and through consulting with healthcare professionals. It should be read in conjunction with the NICE guideline. The report is an implementation tool and focuses on the recommendations that were considered to have a significant impact on national resource utilisation.

The cost and activity assessments in the report are estimates based on a number of assumptions. They provide an indication of the likely impact and are not absolute figures. Assumptions used in the report are based on assessment of the national average. Local practice may be different from this, and the template can be amended to reflect local practice.

Implementation of the guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this costing tool should be interpreted in a way that would be inconsistent with compliance with those duties

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Contents

Executive summary.....	4
<i>Significant resource-impact recommendations</i>	5
<i>Net resource impact</i>	5
<i>Costs</i>	6
<i>Benefits and savings</i>	6
<i>Local costing template</i>	7
1 Introduction.....	8
1.1 <i>Supporting implementation</i>	8
1.2 <i>What is the aim of this report?</i>	8
1.3 <i>Epidemiology of osteoarthritis in adults</i>	9
1.4 <i>Current service provision</i>	10
2 Costing methodology.....	11
2.1 <i>Process</i>	11
2.2 <i>Scope of the cost-impact analysis</i>	11
2.3 <i>General assumptions made</i>	15
2.4 <i>Basis of unit costs</i>	15
3 Significant resource-impact recommendations.....	16
3.1 <i>Invasive treatments for knee osteoarthritis</i>	16
3.2 <i>Topical treatments</i>	18
3.3 <i>NSAIDs and highly selective COX-2 inhibitors</i>	21
3.4 <i>Benefits and savings</i>	22
4 Sensitivity analysis.....	23
4.1 <i>Methodology</i>	23
4.2 <i>Impact of sensitivity analysis on costs</i>	24
5 Impact of guidance for commissioners.....	24
6 Conclusion.....	25
6.1 <i>Total national cost for England</i>	25
6.2 <i>Next steps</i>	25
Appendix A. Approach to costing guidelines.....	27
Appendix B. Results of sensitivity analysis.....	28
Appendix C. References.....	29

Executive summary

This costing report looks at the resource impact of implementing the NICE guideline 'Osteoarthritis: care and management in adults' in England. CCGs commission these services.

The costing method adopted is outlined in appendix A; it uses the most accurate data available, was produced in conjunction with key clinicians, and reviewed by clinical and financial professionals.

The guidance is an update of Osteoarthritis (NICE clinical guideline 59), which was published in February 2008. New recommendations have been included for the care and management of adults with osteoarthritis. However, these recommendations are not expected to have a significant cost impact, because for example, some costs could already be paid for through existing contractual payments in the case of GPs and practice nurses. This costing report focuses on 3 updated recommendations from the original guideline which are still expected to lead to future costs and savings because they are not yet fully implemented.

Savings can still be made through a reduction in the number of arthroscopic lavage and debridement procedures carried out. These savings are not as high as those estimated in the previous costing tool produced in 2008, because significant progress has already been made in reducing the number of these procedures.

Additional savings which have not been quantified in the costing template could be made by; reducing the number of inappropriate diagnostic imaging procedures undertaken; and increasing the proportion of people having follow-up appointments for osteoarthritis which could mean potential problems are picked up earlier in primary care rather than in a secondary care setting.

Significant¹ resource-impact recommendations

This report focuses on the recommendations that are likely to have the greatest resource impact nationally, and therefore require the most additional resources to implement or can potentially generate the biggest savings. They are:

- Do not refer for arthroscopic lavage and debridement² as part of treatment for osteoarthritis, unless the person has knee osteoarthritis with a clear history of mechanical locking (as opposed to morning joint stiffness, 'giving way' or X-ray evidence of loose bodies). [1.4.10]
- Consider topical non-steroidal anti-inflammatory drugs (NSAIDs) for pain relief in addition to core treatments (see recommendation 1.2.5) for people with knee or hand osteoarthritis. Consider topical NSAIDs and/or paracetamol ahead of oral NSAIDs, cyclooxygenase-2 (COX-2) inhibitors or opioids. [1.5.3]
- When offering treatment with an oral NSAID/COX-2 inhibitor, the first choice should be either a standard NSAID³ or a COX-2 inhibitor (other than etoricoxib 60 mg). In either case, co-prescribe with a proton pump inhibitor (PPI), choosing the one with the lowest acquisition cost. [1.5.9]

Net resource impact

The annual change in resource use arising from implementing the recommendations considered in the costing analysis is summarised below.

¹ The following impacts have been defined as significant:

- where the number of people affected by the guidance recommendations is estimated to be over 300 (equivalent to 1 patient per 170,000; in practice, smaller populations may have no patients or possibly more than one, particularly if it is a disease that runs in families and there is a cluster in one area)
- where initial costing work indicates that the national cost is more than £1 million (equivalent to £2000 per 100,000 population).

² This recommendation is a refinement of the indication in [Arthroscopic knee washout, with or without debridement, for the treatment of osteoarthritis](#) (NICE interventional procedure guidance 230 [2007]). The clinical and cost-effectiveness evidence for this procedure was reviewed for the original guideline (published in 2008), which led to this more specific recommendation on the indication for which arthroscopic lavage and debridement is judged to be clinically and cost effective.

³ Further information about standard NSAID prescribing can be found by clicking on the following link [KTT13 Non-steroidal anti-inflammatory drugs \(NSAIDs\)](#).

Description	Cost impact per 100,000 population
Costs	£000
Topical NSAIDs	2.1
PPIs	1.1
Total cost	3.2
Savings	
Arthroscopic lavage and debridement	-18.5
Total savings	-18.5
Net cost/savings (-)	-15.3

Costs

The number of arthroscopic lavage and debridement procedures per 100,000 population is expected to fall from 20 to 10, a reduction of 10. Each procedure prevented would save around £1,880. Therefore, based on the assumptions in the model, around £18,500 could be saved per 100,000 population.

The number of topical NSAIDs prescribed is expected to increase by 5% from 25% to 30% of people with knee and hand osteoarthritis. The annual cost of prescribing 2 topical NSAIDs is around £11 per person. Based on the assumptions in the model, costs per 100,000 population could increase by around £2,100.

The number of proton pump inhibitors prescribed is expected to increase by around 6% from 34% to 40% of people with knee and hand osteoarthritis who are taking oral NSAIDs/COX-2 inhibitors. The annual cost of proton pump inhibitors is around £7 per person. Based on the assumptions in the model, costs per 100,000 population could increase by around £1,100.

Benefits and savings

Implementing the clinical guideline may result in the following savings and benefits:

- A reduction in the number of hospital admissions to secondary care for arthroscopic lavage and debridement, with associated savings.
- If people are encouraged to increase the amount of physical activity they do, they could experience an improved quality of life because they are more likely to be able to continue normal everyday activities. This could also lead to increased productivity, with fewer working days lost to osteoarthritis.
- A reduction in the number of people being referred for surgery because of increased and more effective non-pharmacological treatment and regular follow-up of complex cases.
- Savings may result from a reduction in the number of diagnostic imaging procedures carried out for people with suspected osteoarthritis.
- Increasing the proportion of people having a follow-up appointment for osteoarthritis may lead to cost savings, because potential problems may be picked up earlier in primary care rather than in a secondary care setting. For example, adverse events resulting from continued use of drugs, such as gastrointestinal bleeds, could be reduced.

Local costing template

The costing template produced to support this guideline enables organisations in England, Wales and Northern Ireland to estimate the impact locally and replace variables with ones that depict the current local position. A sample calculation using this template showed that savings of £15,300 could be made for a population of 100,000.

1 Introduction

1.1 *Supporting implementation*

1.1.1 The NICE clinical guideline on [Osteoarthritis: care and management in adults](#) is supported by the following implementation tools:

- costing tools
 - a costing report; this document
 - a local costing template; a simple spreadsheet that can be used to estimate the local cost of implementation
- podcasts; an expert view on implementing the guidance
- baseline assessment tool; assess your baseline against the recommendations in the guidance in order to prioritise implementation activity, including clinical audit

1.2 *What is the aim of this report?*

1.2.1 This report provides estimates of the cost impact arising from implementation of guidance on osteoarthritis in England. These estimates are based on assumptions made about current practice and prediction of how current practice might change implementation.

1.2.2 This report aims to help organisations plan for the financial implications of implementing NICE guidance.

1.2.3 This report does not reproduce the NICE guideline on [osteoarthritis](#) and should be read in conjunction with it.

1.2.4 The costing template that accompanies this report is designed to help those assessing the resource impact at a local level in England, Wales or Northern Ireland.

1.3 *Epidemiology of osteoarthritis in adults*

- 1.3.1 The [osteoarthritis](#) guideline uses a working diagnosis of osteoarthritis as follows:
- Diagnose osteoarthritis clinically without investigations if a person:
 - is 45 or over **and**
 - has activity-related joint pain **and**
 - has either no morning joint-related stiffness or morning stiffness that lasts no longer than 30 minutes.
- 1.3.2 The exact incidence and prevalence of osteoarthritis are difficult to determine because the clinical syndrome of osteoarthritis (joint pain and stiffness) does not always correspond with the structural changes of osteoarthritis (usually defined as abnormal changes in the appearance of joints on radiographs).
- 1.3.3 For the purpose of this report and the accompanying costing template, the number of people with osteoarthritis in England has been estimated at around 7.3 million people. This was calculated from information in [Osteoarthritis in general practice: data and perspectives](#), a report published by Arthritis Research UK (2013). The report estimated the number of people with osteoarthritis in the UK at around 8.75 million people; the proportion of this number in England was then calculated using data from the Office for National Statistics.
- 1.3.4 Evidence suggests that the prevalence of osteoarthritis is higher in women than in men. The [Osteoarthritis in general practice: data and perspectives](#) report estimated the proportion of women and men in the population who have osteoarthritis.
- 1.3.5 It is estimated that around 41% of people with osteoarthritis regularly consult with their GP about their condition. This is the

group of people who may receive prescriptions for topical NSAIDs and proton pump inhibitors.

1.3.6 Table 1 shows the prevalence of osteoarthritis and the proportion of people who regularly visit their GP about the condition.

Table 1 Prevalence of osteoarthritis and proportion of people with osteoarthritis who regularly visit their GP per 100,000 population

Sex	Aged 45 and over	Prevalence of osteoarthritis ¹		Proportion who regularly visit their GP ²	
	Number	%	Number	%	Number
Men	20,206	26.56	5,367	41	2,200
Women	21,504	36.56	7,861	41	3,223
Total	41,710		13,228		5,423

1. Prevalence data obtained from 'Osteoarthritis in general practice: data and perspectives' Arthritis Research UK
2. Arthritis Care OA nation 2012: the most comprehensive UK report of people with osteoarthritis

1.3.7 The number of people in England with osteoarthritis is likely to be increasing because of an ageing population and rising obesity levels.

1.4 Current service provision

1.4.1 Current treatments for osteoarthritis are concerned with managing symptoms such as pain. There is no medication that has been proven to prevent the disease or modify its course.

1.4.2 Most people with osteoarthritis present first to their GP. However, the care pathway for osteoarthritis is not well defined and differs depending on the anatomical site. Because osteoarthritis is a chronic condition, people may re-present to their GP over many years.

1.4.3 A small percentage of people with osteoarthritis may be referred from their GP to allied healthcare professionals (predominantly physiotherapy, but also occupational therapy and podiatry services), or to rheumatologists and orthopaedic surgeons. People with knee or hip osteoarthritis make up most surgical

referrals. In parts of the UK, intermediary or triage services (often led by physiotherapists) will see such surgical referrals, in line with the [NHS Musculoskeletal Framework \(2006\)](#).

2 Costing methodology

2.1 Process

- 2.1.1 We use a structured approach for costing clinical guidelines (see appendix A).
- 2.1.2 We have to make assumptions in the costing model. These are tested for reasonableness with members of the Guideline Development Group (GDG) and key clinical practitioners in the NHS.
- 2.1.3 Local users can assess local cost impact, using the costing template as a starting point, and update assumptions to reflect local circumstances.

2.2 Scope of the cost-impact analysis

- 2.2.1 The guideline offers best practice advice on the care and management of osteoarthritis in adults.
- 2.2.2 The guidance does not cover management of predisposing and associated conditions, including:
 - spinal, neck and back pain
 - crystal arthritis (gout or pseudo-gout)
 - inflammatory arthritis (including rheumatoid arthritis, psoriatic arthritis and the seronegative arthritides)
 - septic arthritis
 - diseases of childhood that predispose to osteoarthritis
 - medical conditions presenting with joint inflammation, such as haemochromatosis.

Therefore, these issues are outside the scope of the costing work.

2.2.3 We worked with the GDG and other professionals to identify the recommendations that would have the most significant resource-impact (see table 2). Costing work has focused on these recommendations.

Table 2 Recommendations with a significant resource impact

Recommendation	Recommendation number	Guideline key priority?
Do not refer for arthroscopic lavage and debridement ^a as part of treatment for osteoarthritis, unless the person has knee osteoarthritis with a clear history of mechanical locking (as opposed to morning joint stiffness, 'giving way' or X-ray evidence of loose bodies).	1.4.10	x
Consider topical non-steroidal anti-inflammatory drugs (NSAIDs) for pain relief in addition to core treatments (see recommendation 1.2.5) for people with knee or hand osteoarthritis. Consider topical NSAIDs and/or paracetamol ahead of oral NSAIDs, cyclooxygenase-2 (COX-2) inhibitors or opioids.	1.5.3	x
When offering treatment with an oral NSAID/COX-2 inhibitor, the first choice should be either a standard NSAID or a COX-2 inhibitor (other than etoricoxib 60 mg). In either case, co-prescribe with a PPI, choosing the one with the lowest acquisition cost.	1.5.9	x
^a This recommendation is a refinement of the indication in Arthroscopic knee washout, with or without debridement, for the treatment of osteoarthritis (NICE interventional procedure guidance 230 [2007]). The clinical and cost-effectiveness evidence for this procedure was reviewed for the original guideline (published in 2008), which led to this more specific recommendation on the indication for which arthroscopic lavage and debridement is judged to be clinically and cost effective.		

2.2.4 Nine of the recommendations in the guideline have been identified as key priorities for implementation. None of these are among the 3 recommendations considered to have a significant resource impact. The recommendations that have been identified as key priorities for implementation are discussed below.

Diagnosis

2.2.5 Recommendation 1.1.1 is to diagnose osteoarthritis without investigations if a person is 45 or over, has activity-related joint pain and has either no morning joint stiffness or morning stiffness that lasts no longer than 30 minutes. Diagnosis is expected to take place in a GP setting, and because no additional investigations or staff are required it is not expected that this will incur a significant cost. Savings could be made by reducing the number of inappropriate diagnostic imaging procedures undertaken. It is not possible to quantify the number of imaging procedures that could be avoided. The current costs of some of these procedures are given in figure 1 below.

Table 3 Cost of diagnostic imaging¹

Image type	Code	Description	Cost (£)
X-ray	DAPF	Direct access plain film X-ray	25
MRI	RA01Z	Magnetic Resonance Imaging Scan, one area, no contrast	140
Ultrasound	RA23Z	Ultrasound Scan less than 20 minutes	45
CT	RA08Z	Computerised Tomography Scan, one area, no contrast	78
Scintigraphy	RA36Z	Nuclear Medicine - category 2	159

1. Payments by results 2013-14

Holistic approach to osteoarthritis assessment and management

2.2.6 Recommendation 1.2.5 focuses on offering advice on access to appropriate information, activity and exercise, and interventions to achieve weight loss for people who are overweight or obese. The information is assumed to already be available, and offering advice on exercise and weight loss is covered in other pieces of guidance published by NICE, such as that on [physical activity: brief advice for adults in primary care](#) (PH44) and [obesity](#) (CG43).

Education and self-management

- 2.2.7 Recommendations 1.3.1 and 1.3.2 focus on offering ongoing accurate verbal and written information to people with osteoarthritis and agreeing individualised self-management strategies with them. These two recommendations are expected to be carried out by a GP or practice nurse, and therefore the cost of staff time would be included in their existing contractual payments.

Non-pharmacological management

- 2.2.8 Recommendation 1.4.1 is related to giving people with osteoarthritis advice about the benefits of exercise. The cost of brief advice to encourage exercise was considered in the costing report and template for [physical activity: brief advice for adults in primary care](#) (NICE public health guidance 44). Provision of exercise should be shared between formal exercise classes, rehabilitation and prehabilitation sessions in NHS settings and exercise provision by councils, the private sector and patients.

Referral for consideration of joint surgery

- 2.2.9 Recommendations 1.6.2 and 1.6.4 are concerned with basing decisions on referral threshold on discussions rather than using scoring tools for prioritisation, and referring the person for consideration of joint surgery before there is prolonged functional limitation and severe pain. Both recommendations relate to referrals that could result in surgery, but do not recommend an increase or decrease in surgery, and therefore no cost impact or savings are expected from these recommendations. Similar recommendations appeared in the original guideline published in 2008.

Follow-up and review

- 2.2.10 Recommendations 1.7.1 and 1.7.2 advise on offering regular reviews for people with symptomatic osteoarthritis. This is not

expected to have a significant cost impact because the healthcare professionals responsible for providing the reviews would already be in post and it is not expected that additional staff would be required to implement these recommendations. Increasing the proportion of people having follow-up appointments for osteoarthritis may lead to cost savings, because potential problems may be picked up earlier in primary care rather than in a secondary care setting. For example, adverse events resulting from continued use of drugs, such as gastrointestinal bleeds, could be reduced.

Consideration of costs and savings

- 2.2.11 We have limited the consideration of costs and savings to direct costs to the NHS that will arise from implementation. We have not included consequences for the individual, the private sector or the not-for-profit sector. If applicable, any realisable cost savings arising from a change in practice have been offset against the cost of implementing the change.

2.3 *General assumptions made*

- 2.3.1 The model is based on annual prevalence and population estimates (see table 1)
- 2.3.2 The costing report and template are based on a population of people aged 45 years and over who regularly consult their GP about their osteoarthritis. Osteoarthritis is most common in this age group, and the recommendations in the NICE guideline on [osteoarthritis](#) focus on this population.

2.4 *Basis of unit costs*

- 2.4.1 If a national tariff price or indicative price exists for an activity this has been used as the unit cost.
- 2.4.2 Using these prices ensures that the costs in the report are the cost to the clinical commissioning group (CCG) of commissioning

predicted changes in activity at the tariff price, but may not represent the actual cost to individual trusts of delivering the activity.

3 Significant resource-impact recommendations

3.1 *Invasive treatments for knee osteoarthritis*

Recommendation

- Do not refer for arthroscopic lavage and debridement⁴ as part of treatment for osteoarthritis, unless the person has knee osteoarthritis with a clear history of mechanical locking (as opposed to morning joint stiffness, 'giving way' or X-ray evidence of loose bodies). [1.4.10]

Background

- 3.1.1 A reduction in the number of hospital admissions and arthroscopic lavage and debridement procedures in secondary care for people with knee osteoarthritis could lead to significant savings.
- 3.1.2 There are no standardised referral criteria for this procedure, and evidence in the full guideline states that there is no general consensus about which patients should be offered the procedure. Recommendation 1.4.10 is expected to lead to a reduction in the number of arthroscopic lavage and debridement procedures.

Assumptions made

- 3.1.3 Based on the 2011/12 [Hospital Episode Statistics](#), the number of people aged 45 years and over with a diagnosis of knee osteoarthritis who received arthroscopic lavage and debridement was around 10,900 in England. This equates to around 0.36% of

⁴ This recommendation is a refinement of the indication in Arthroscopic knee washout, with or without debridement, for the treatment of osteoarthritis (NICE interventional procedure guidance 230 [2007]). The clinical and cost-effectiveness evidence for this procedure was reviewed for the original guideline (published in 2008), which led to this more specific recommendation on the indication for which arthroscopic lavage and debridement is judged to be clinically and cost effective.

the people with osteoarthritis who regularly consult their GP, and is equivalent to 20 people per 100,000 population.

- 3.1.4 This figure of 10,900 could be an underestimate because it includes people receiving arthroscopic lavage and debridement with a diagnosis of knee osteoarthritis only. It is possible that, in certain cases, people could be being diagnosed with knee pain instead of knee osteoarthritis, which has not been included in this data extract.
- 3.1.5 Based on the expert clinical opinion of the GDG it is assumed that around 50% of the 10,900 people with a diagnosis of knee osteoarthritis who currently receive arthroscopic lavage and debridement will still be referred for arthroscopic lavage and debridement if the recommendation is fully implemented. This is equivalent to 10 people per 100,000 population.
- 3.1.6 A weighted average cost (£1,692) for arthroscopic lavage and debridement has been calculated using the payment by results tariff for 2013/14.
- 3.1.7 People who have an arthroscopic lavage and debridement procedure are expected to have 2 outpatient appointments with a consultant: 1 before the procedure and 1 after the procedure.
- 3.1.8 The cost of an outpatient first attendance for trauma and orthopaedics is £121 (payment by results 2013-14) and the cost of an outpatient follow-up attendance for trauma and orthopaedics is £71 (payment by results 2013-14).

Cost summary

- 3.1.9 The number of arthroscopic lavage and debridement procedures per 100,000 population is expected to fall from 20 to 10, a reduction of 10 people per 100,000 population.

3.1.10 The net savings as a result of the fall in arthroscopic lavage and debridement procedures per 100,000 population are summarised in table 3.

Table 4 Arthroscopic lavage and debridement for knee osteoarthritis

	Unit cost	Current		Proposed		Change	
		Number of patients	Cost (£000s)	Number of patients	Cost (£000s)	Number of patients	Cost (£000s)
Arthroscopic lavage and debridement	£1,692	20	33.3	10	16.6	10	-16.7
Outpatient first attendance for trauma and orthopaedics	£121	20	2.4	10	1.2	10	-1.2
Outpatient follow-up attendance for trauma and orthopaedics	£71	20	1.4	10	0.7	10	-0.7
Total	1,884		37.1		18.5		-18.5

Other considerations

3.1.11 Encouraging people to do exercise, where appropriate, could be a low-cost method of treating knee osteoarthritis.

3.2 Topical treatments

Recommendation

- Consider topical non-steroidal anti-inflammatory drugs (NSAIDs) for pain relief in addition to core treatments (see recommendation 1.2.5) for people with knee or hand osteoarthritis. Consider topical NSAIDs and/or paracetamol ahead of oral NSAIDs, cyclooxygenase-2 (COX-2) inhibitors or opioids. [1.5.3]

Background

- 3.2.1 The expert clinical opinion of the GDG was that this recommendation would lead to an increase in the use of topical NSAIDs. An increase in prescribing of topical NSAIDs could lead to increased prescribing costs in the NHS.

Assumptions made

- 3.2.2 The proportion of people with knee and/or hand osteoarthritis was calculated by adding the 4.7million people estimated to have knee osteoarthritis to the 1.6 million people with hand and wrist osteoarthritis (Arthritis Research UK, 2013) and dividing this figure by 8.75 million, which is the total number of people estimated to have osteoarthritis. Therefore it is assumed that around 72% of people with osteoarthritis have the condition in their knees and/or hands.
- 3.2.3 Applying the 72% estimate to the number of people with osteoarthritis who regularly consult their GP equates to around 3,890 people per 100,000 population with knee or hand osteoarthritis who regularly consult their GP.
- 3.2.4 Based on the GDG's expert clinical opinion, it is assumed that 25% of people who regularly visit their GP because of knee or hand osteoarthritis are currently prescribed topical NSAIDs, which equates to around 970 people per 100,000 population.
- 3.2.5 The weighted average cost per item of topical NSAIDs is around £5.40 per tube. This was calculated using 2 different NSAIDs, ibuprofen and diclofenac, whose unit costs were taken from the [national drug tariff](#).
- 3.2.6 The average number of items of topical NSAIDs prescribed to each person is 2 per year, based on a sample taken from a GP practice in England. Therefore the annual cost of prescribing

topical NSAIDs per person is around £11 (calculated by multiplying £5.40 by 2).

3.2.7 The model assumes that the number of people who receive prescriptions for topical NSAIDs for their knee and/or hand osteoarthritis will increase from around 970 (25% of people who regularly visit their GP because of knee or hand osteoarthritis) to 1,170 (30% of people who regularly visit their GP because of knee or hand osteoarthritis) per 100,000 population (based on the GDG's expert clinical opinion). Therefore it is assumed that the annual number of topical NSAIDs prescribed will increase by around 400 per 100,000 population if the guideline is fully implemented. This is because it is assumed that each person will be prescribed 2 topical NSAIDs each per year.

Cost summary

3.2.8 The number of topical NSAIDs prescribed is expected to increase by around 400 per 100,000 population. The weighted average cost of topical NSAIDs per person is around £5.40. Based on the assumptions in the model, costs per 100,000 population could increase by around £2,100 per year.

3.2.9 The cost of prescribing topical NSAIDs per 100,000 population is summarised in table 4.

Table 5 Topical NSAIDs

	Unit cost	Current		Proposed		Change	
		Number of patients	Cost (£000s)	Number of patients	Cost (£000s)	Number of patients	Cost (£000s)
Topical NSAIDs	10.82	972	10.5	1,166	12.6	194	2.1

Other considerations

- 3.2.10 Because no specific NSAID is recommended, the cost may be different for local organisations. The unit cost can be changed in the costing template to reflect local circumstances.

3.3 NSAIDs and highly selective COX-2 inhibitors

Recommendation

- When offering treatment with an oral NSAID/COX-2 inhibitor, the first choice should be either a standard NSAID or a COX-2 inhibitor (other than etoricoxib 60 mg). In either case, co-prescribe with a proton pump inhibitor (PPI), choosing the one with the lowest acquisition cost. [1.5.9]

Background

- 3.3.1 The expert clinical opinion of the GDG was that this recommendation would lead to an increase in the use of PPIs. An increase in the proportion of people co-prescribed PPIs is likely to lead to increased prescribing costs in the NHS.

Assumptions made

- 3.3.2 The GDG's expert clinical opinion estimates that 50% of people in the eligible population with osteoarthritis who regularly visit their GP are currently prescribed an oral NSAID/COX-2 inhibitor.
- 3.3.3 Of the people with osteoarthritis who take an oral NSAID/COX-2 inhibitor, around a third (34%) are currently believed to be prescribed a PPI; this equates to around 920 people per 100,000 population (based on the GDG's expert clinical opinion).
- 3.3.4 If the guideline is fully implemented, everyone who is prescribed an oral NSAID/COX-2 inhibitor should also be prescribed a PPI. However, the model assumes a more prudent proportion of 40% of people being prescribed an oral NSAID/COX-2 inhibitor plus a PPI, which equates to around 1,090 people per 100,000 population.

Cost summary

- 3.3.5 The number of people prescribed a PPI is expected to increase from around 920 people to around 1,090 people per 100,000 population. The annual cost of PPIs per person is around £7. Based on the assumptions used in the model, costs per 100,000 population could increase by around £1,100.
- 3.3.6 The net cost of co-prescribing PPIs with oral NSAIDs/COX-2 inhibitors per 100,000 population is shown in table 5.

Table 6 PPIs

	Unit cost	Current		Proposed		Change	
		Number of patients	Cost (£000s)	Number of patients	Cost (£000s)	Number of patients	Cost (£000s)
PPIs	6.86	922	6.3	1,085	7.4	163	1.1

Other considerations

- 3.3.7 If the total number of people being prescribed oral NSAIDs/COX-2 inhibitors can be reduced, this will decrease the additional cost of prescribing PPIs.

3.4 *Benefits and savings*

- 3.4.1 A reduction in the number of hospital admissions for arthroscopic lavage and debridement procedures could lead to significant savings in clinical commissioning group (CCG) budgets. Secondary care providers could also benefit from increased capacity in hospitals to carry out procedures on other patients.
- 3.4.2 If people are encouraged to increase the amount of physical activity they do, they could experience an improved quality of life because they are more likely to be able to continue normal everyday activities. This could also lead to increased productivity with fewer working days lost to osteoarthritis.

- 3.4.3 A reduction in the number of people being referred for surgery may occur because of increased and more effective non-pharmacological treatment for people with osteoarthritis and regular follow-up of complex cases.
- 3.4.4 Savings may result from a reduction in the number of diagnostic imaging procedures carried out for people with suspected osteoarthritis.
- 3.4.5 Increasing the proportion of follow-up appointments for people with osteoarthritis may lead to cost savings, because potential problems may be picked up earlier in primary care rather than in a secondary care setting. For example, adverse events resulting from continued use of drugs, such as gastrointestinal bleeds, could be reduced.

4 Sensitivity analysis

4.1 Methodology

- 4.1.1 There are a number of assumptions in the model for which no empirical evidence exists; these are therefore subject to a degree of uncertainty.
- 4.1.2 Appropriate minimum and maximum values of variables were used in the sensitivity analysis to assess which variables have the biggest impact on the net cost or saving. This enables users to identify the significant cost drivers.
- 4.1.3 It is not possible to arrive at an overall range for total cost because the minimum or maximum of individual lines are unlikely to occur simultaneously. We undertook one-way simple sensitivity analysis, altering each variable independently to identify those that have greatest impact on the calculated total cost.
- 4.1.4 Appendix B contains a table detailing all variables modified, and the key conclusions drawn are discussed below.

4.2 *Impact of sensitivity analysis on costs*

Future proportion of arthroscopic lavage and debridement procedures for people with knee osteoarthritis

- 4.2.1 The baseline saving of implementing the guidance is approximately –£15,300 per 100,000 population. This assumes that in future 0.18% of people with knee osteoarthritis will have an arthroscopic lavage and debridement procedure. Varying the proportion of arthroscopic lavage and debridement procedures in the future between 0.16% and 0.20% results in implementation savings ranging from around –£17,500 to –£13,400 per 100,000 population, a difference of £4,100.

Annual number of NSAIDs prescribed per person

- 4.2.2 The baseline saving of implementing the guidance is approximately –£15,300 per 100,000 population. This assumes that everyone prescribed topical NSAIDs receives 2 tubes per year. Varying the number of NSAIDs prescribed per person from between 1 and 4 results in implementation savings ranging from around –£16,400 to –£13,200 per 100,000 population, a difference of £3,200.

5 Impact of guidance for commissioners

- 5.1.1 Arthroscopic lavage and debridement procedures for knee osteoarthritis fall under the scope of payment by results. However, although prescribing of topical NSAIDs and PPIs for osteoarthritis may be initiated in secondary care, ongoing prescribing is likely to be carried out mainly in primary care and therefore falls outside the scope of payment by results. Primary care prescribing costs are paid for by CCGs.
- 5.1.2 The costs for arthroscopic lavage and debridement procedures for knee osteoarthritis and topical NSAIDs fall under the programme budgeting category 15X (musculoskeletal problems). However,

the prescribing of PPIs falls under programme budgeting category 13A (problems of the gastro intestinal system [upper GI]).

6 Conclusion

6.1 *Total cost per 100,000 population*

6.1.1 Using the significant resource-impact recommendations shown in table 2 and assumptions specified in section 3 we have estimated the annual impact of implementing these recommendations per 100,000 population to be a saving of around £15,300. Table 6 shows the breakdown of cost of each significant resource-impact recommendation.

Table 7 Net resource impact of implementing guideline

Description	Cost impact per 100,000 population
Costs	£000
Topical NSAIDs	2.1
PPIs	1.1
Total cost	3.2
Savings	
Arthroscopic lavage and debridement	-18.5
Total savings	-18.5
Net cost/savings (-)	-15.3

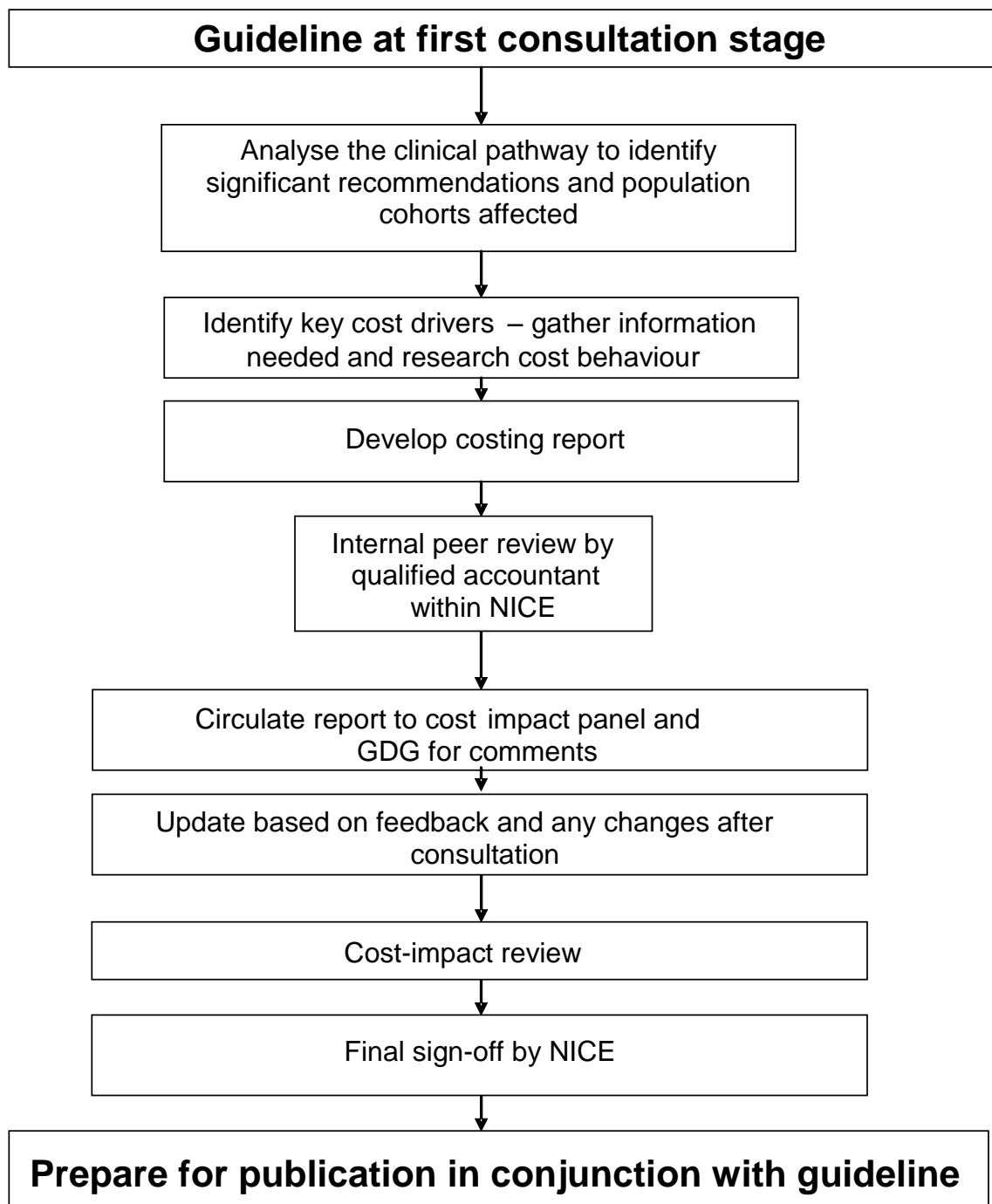
6.1.2 The costs and savings presented are estimates and should not be taken as the full cost of implementing the guideline.

6.2 *Next steps*

6.2.1 The local costing template produced to support this guideline enables organisations such as CCGs or health boards in Wales and Northern Ireland to estimate the impact locally and replace variables with ones that depict the current local position. A sample calculation using this template showed that a population of

100,000 could expect to save around £15,300. Use this template to calculate the cost of implementing this guidance in your area.

Appendix A. Approach to costing guidelines



Appendix B. Results of sensitivity analysis

Table 1 Individual variable sensitivity

	Baseline value	Minimum value	Maximum value	Recurrent costs			Change (£000's)
				Baseline costs (£000's)	Minimum costs (£000's)	Maximum costs (£000's)	
Prevalence of osteoarthritis in men	26.56%	24.00%	30.00%	-15.3	-14.7	-16.3	-1.6
Prevalence of osteoarthritis in women	36.56%	33.00%	40.00%	-15.3	-14.4	-16.2	-1.7
Future proportion of arthroscopic lavage and debridement procedures for people with knee osteoarthritis	0.18%	0.16%	0.20%	-15.3	-17.5	-13.4	4.1
Annual cost of topical NSAIDs	10.82	8.40	13.24	-15.3	-15.8	-14.8	0.9
Future proportion of people taking PPIs	40.00%	36.0%	44.0%	-15.3	-16.0	-14.6	1.5
Annual number of NSAIDs prescribed per person	2	1	4	-15.3	-16.4	-13.2	3.2

Appendix C. References

Arthritis Care (2012) [OA nation 2012: the most comprehensive UK report of people with osteoarthritis](#), London: HealthSmith Consulting Ltd

Arthritis Research UK (2013) [Osteoarthritis in general practice: data and perspectives](#), Chesterfield

Peat G, McCarney R, Croft P (2001) [Knee pain and osteoarthritis in older adults: a review of community burden and current use of primary health care](#).

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