



2017

# Commissioning Guide:

## Painful Osteoarthritis of the Knee

Sponsoring Organisation: British Association of Knee Surgery (BASK), British Orthopaedic Association (BOA), Royal College of Surgeons of England (RCSEng)

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NICE has accredited the process used by Surgical Speciality Associations and Royal College of Surgeons to produce its Commissioning guidance. Accreditation is valid for 5 years from September 2017. More information on accreditation can be viewed at [www.nice.org.uk/accreditation](http://www.nice.org.uk/accreditation)





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## Introduction

This pathway refers to patients with symptomatic osteoarthritis of the knee(s).

Osteoarthritis (OA) of the knee describes a clinical syndrome of joint damage resulting in pain accompanied by varying degrees of functional limitation and reduced quality of life.

Close to 20% of adults aged 45 and over have sought treatment for knee osteoarthritis (1).

The majority of patients present to primary care with symptoms of pain and stiffness, which reduces mobility and with associated reduction in quality of life.

Osteoarthritis may not be progressive and most patients will not need surgery, with their symptoms adequately controlled by non-surgical measures as outlined by NICE (2) (3). When patient's symptoms are not controlled by up to 3 months of non-operative treatment they become candidates for assessment for joint surgery. A decision to have joint surgery should account for pre-operative levels of symptoms, capacity to benefit, expectation of the outcome and attitude to the risks involved, as well as any personal preferences.

All treatment choices must be made via a shared decision making process. Patient information resources and decision support tools are on their own insufficient to enable this, given that up to 61% of working adults do not understand health information, such as decision aids<sup>1</sup>. Emphasis should be on dialogue enabling patients' to realise they have a choice, understand the options available to them, and make a decision as to which option to choose<sup>2</sup>.

Knee replacement is the commonest type of surgery used to treat osteoarthritis. The lifetime risk of requiring joint replacement is 10% and in 2011 approximately 70,000 were implanted in the UK (4).

Total knee replacement is highly effective in up to 85% of patients, providing consistent lasting benefit with 95% 7-year joint survival (5) (6). It is highly cost effective (7).

Alternatives to total knee replacement are partial replacement or osteotomy around the knee, both of which can be offered in units with a specialist knee surgery practice (8) (9).

This pathway is a guide which can be modified according to the needs of the local health economy.

Commissioners should be conscious of the Getting it Right First Time programme. Getting it Right First Time is a Department of Health (DH) supported quality improvement initiative focused on improving quality and efficiency in orthopaedic care, and its implementation is a major priority. It does not directly relate to earlier stages in the pathway, and does not conflict with this document. However, commissioners should maintain awareness of the initiative to be alert to any interdependencies that may arise.

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<sup>1</sup> (Rowlands et al 2015).

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/460710/4b\\_Health\\_Literacy-Briefing.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/460710/4b_Health_Literacy-Briefing.pdf)

<sup>2</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3445676/>

# 1 High Value Care Pathway for Painful Osteoarthritis of the Knee

## 1.1 Primary Care

Patients with osteoarthritis usually present in Primary Care with a history of knee pain and loss of function. Initial assessment should focus on identifying features that are typical of osteoarthritis and allow a diagnosis to be made. Care must be taken to exclude causes of knee pain that require alternative and more urgent referral pathways.

### **Assessment and diagnosis:**

A clinical diagnosis of osteoarthritis can be made by focusing on the following six clinical symptoms and signs: persistent knee pain, limited knee stiffness (<30 minutes), reduced function, crepitus, restricted movement and bone enlargement (10).

Plain radiographs, with standing AP (or long-leg) and a lateral view may be taken for initial diagnosis but are not essential in patients over 45. Skyline and Rosenberg views may also be requested. Note that standard radiographs are required on all patients referred to secondary care.

Emergency referral to secondary care (same day):

- Knee pain in association with a red warm joint with acute restriction in range of movement and fever leading to suspicion of septic arthritis.

Consider urgent referral to secondary care if a patient presents with knee pain in association with any red flag symptoms or signs (<2/52):

- History of previous malignancy
- Localised hard mass adjacent to the knee
- Unexplained weight loss
- Severe night pain not controlled by analgesia
- New symptoms of inflammation in several joints suggesting systemic inflammatory joint disease (rheumatology referral)

If the patient's history includes trauma or an injury, then the patient should progress down your local knee injury pathway.

### **Management once a diagnosis of osteoarthritis is made - offered to all patients (3) (10):**

The majority of patients can be initially managed adequately in primary care by following the NICE guidance for managing osteoarthritis (11). This includes:

- Agree a plan with the patient for improving their health and wellbeing through management of their OA
- Core treatments for all patients: access to appropriate information regarding the condition, advice to encourage activity and exercise (12) (13) (14) (15) (16) and interventions to achieve weight loss if the patient is overweight. Weight maintenance also has a role in managing symptoms (17).

- Treatment should include provision for supported self-management<sup>3</sup>.

If further treatment is required then consideration should be given to the following additional non-pharmacological and pharmacological treatments (14), in light of the individual's patient's needs and preferences: manual therapy (e.g. physiotherapy) (13), supports and braces (18), shock absorbing shoes or insoles, local heat and cold therapy, non-steroidal anti-inflammatory medication (topical or oral) or COX-2 inhibitors with a proton pump inhibitor, opioid medication, and intra-articular corticosteroid knee injections<sup>4</sup>.

Patients should be encouraged to make use of tools to support their full involvement in decisions and their care, of which there are a number of options, e.g. option grids.

Patients with symptomatic knee osteoarthritis require regular long-term review of symptoms. Consideration should be given to monitoring the person's symptoms and their impact on everyday activities and quality of life. Reviews should include an on-going review of the patient's knowledge of the condition, their personal preferences, their ability to access services, the effectiveness and tolerance of all treatments and their support for self-management.

***Referral for consideration of knee surgery (joint replacement or joint preserving surgery):***

Refer patients with moderate or severe symptoms that are refractory for up to 3 months of non-surgical treatment.

When considering referral for surgery, use the following NICE guidelines: (3) (11):

Patients should have received and engaged in Core non-operative treatment and at least one additional non-operative therapy.

- Consider referral for joint replacement surgery for people with osteoarthritis who experience joint symptoms (pain, stiffness and reduced function) that have a substantial impact on their quality of life and are refractory to non-surgical treatment.
- Base referral decisions on discussions between the patient, referring clinicians and surgeons, rather than using current scoring tools and thresholds for prioritisation<sup>5</sup>.
- Refer patients before there is prolonged and established functional limitation and severe pain.
- Patient specific factors such as age, gender, smoking, obesity and co-morbidity should not be barriers to referral. Any impact these may have on surgical outcomes should be explained to the patient, through a shared decision making process, to enable them to make a joint decision on their care with the clinician.

Ensure that patients who are referred are given appropriate information, including details of how care pathways

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<sup>3</sup> Hurley, M. V., Walsh, N. E., Mitchell, H., Nicholas, J., & Patel, A. (2012). Long-term outcomes and costs of an integrated rehabilitation program for chronic knee pain: A pragmatic, cluster randomized, controlled trial. *Arthritis Care and Research*, 64(2), 238-247. Hurley, M., Walsh, N., & Jessep, S. (2013). Self-management for chronic knee pain: using group physiotherapy to teach exercises and coping strategies. <http://www.evidence.nhs.uk/qipp>. National Institute for Health and Clinical Excellence, Quality Innovation Productivity and Prevention Collection.

<sup>4</sup> (Maricar et al 2015 PHD Thesis). Maricar N (2015). University of Manchester

<sup>5</sup> Using scoring tools to monitor symptoms can be useful to support shared decision making, but they were not designed for this purpose and so their use in this regard should be approached with caution.



are organised in their local area.

Ensure optimisation of modifiable systemic or local risk factors that may delay surgical treatment prior to referral (e.g. investigation and treatment of anaemia or leg ulcers).

Refer patients with osteoarthritis of the knee who are refractory to non-operative treatment regardless of the radiographic grade of disease.

Referral can be made to an intermediate care service or direct to secondary care, according to locally agreed service pathways.

## 1.2 Intermediate Care<sup>6</sup>

This may be provided by certified healthcare professionals in a number of different settings including Integrated Clinical Assessment and Treatment Services (ICATS) and can provide: assessment, non-surgical treatment programmes, referral to secondary care and postoperative care.

They should form part of an integrated care programme with close links to primary and secondary care. Their introduction is aimed at ensuring patients are on the correct high value pathway.

### **Assessment:**

This should be identical to that in primary care attempting to exclude Red Flags and confirming the diagnosis of osteoarthritis.

### **Introducing further non-operative interventions above Core therapy in line with NICE guidance:**

This may include the introduction of specific supervised and evidence based manual therapy (e.g. physiotherapy) programs with set goals.

In addition intra-articular injection of corticosteroid may be provided.

Interventions should only be introduced if the likelihood of helping patients is high. If not consider referral to avoid introducing delay in diagnosis or treatment.

Encourage engagement with shared decision-making, to support patient's full involvement in decisions and their care. There are a number of decision making tools available, e.g. option grids.

### **Referral to specialist Secondary Care:**

Refer where there is persistent pain and disability not responding to 3 months of evidence based non-surgical treatment.

Referral to Secondary Care should follow NICE guidance as laid out above for primary care.

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<sup>6</sup> Those services that do not require the resources of a general hospital, but are beyond the scope of the traditional primary care team.

## 1.3 Secondary Care

### **Assessment**

The patient's history should be established with focus on pain, disability, expectation and co-morbidities. Examination of the knee and other joints should include assessment for deformity, swelling and reduction in range of movement.

If additional imaging is required, request specialist plain radiographs, with standing AP (or long-leg) and a lateral view. Skyline and Rosenberg views may also be requested.

MRI imaging is indicated if plain radiographs seem to underestimate joint damage or a more detailed view of the joint surface is required; in many cases this will not be necessary (19).

### **The decision to undergo surgery or not**

The decision to undergo surgery is based on their symptom pattern, with the type of surgery determined by the pattern of joint damage and the patient's preference.

All patients must have engaged in a shared decision making process about alternatives, with a view to fully involve them in decisions and their care. This includes presenting the patient with information on all treatment options, including surgery, and a clear description of the risks and benefits of each treatment (20). There are a number of tools available to support this process, e.g. option grids.

### **Treatment post-referral to Secondary Care**

- Non-operative measures (Refer back to Intermediate Care 1.1/Primary Care 1.2):

Patients should be offered continued support with all non-operative measures (advice, exercise, weight loss, manual therapy, oral medication, injection therapy, splints and braces).

A period of observation of symptoms (working with Primary Care) can be offered, if patients are undecided about joint replacement.

Patients where the shared decision is not to undergo joint surgery require on-going support with non-operative measures, as above.

Patients should be informed that the decision to have surgery can be a dynamic process and a decision to not undergo surgery does not exclude them from having surgery at a future time point.

- Surgical option: *Total knee replacement*

Total knee replacement is highly clinically effective and cost effective (5) (7) (21). Joint survival is 95% at 7-years (6). It should be considered for patients with:

- Moderate or severe knee pain not adequately controlled by 3 months of non-surgical management, following NICE guidance.
- Evidence of exposed bone present in at least one of the knee joint compartments (Kellgren-Lawrence [KL] Grade III and above).

Patients outside these criteria may still be considered for surgery but a second opinion/recorded case discussion is advised. Cases focus on patients without pain (the primary indication) but who present with:

- Functional disability in the presence of end stage cartilage disease.
- Progressive deformity of the knee (varus/valgus) with functional disability.

■ Surgical option: *Partial knee replacement*

In this procedure only one compartment of the arthritic knee is replaced. It can be considered for patients with:

- Moderate or severe knee pain not adequately controlled by 3 months of non-surgical management, following NICE guidance.
- Grade III and above arthritis confined to a single joint compartment.

Partial joint replacement can also provide good outcome but the survival is lower than total knee replacement (6) (8) (22) (23) (24) (25). Advantages are faster recovery, reduced morbidity, and reduced 90-day mortality (26) (27). As partial knee replacement is less common it is more appropriately commissioned and delivered by more specialised units, with experienced surgeons, performing around 12 such procedures within a unit per year (9).

■ Surgical option: *Osteotomy around the knee*

High tibial osteotomy involves removing or adding bone to realign the limb and offload the knee (28). It is effective and can provide functional outcomes similar to those seen after joint replacement (29). The post-operative failure-rate at 10 years is around 10-40% (30). There is no published cost-effectiveness data. It can be technically demanding and not all providers will be able to offer this service (31). It should be considered for patients with:

- Moderate to severe knee pain not adequately controlled by 3 months of non-surgical management, following NICE guidance.
- Diagnosis of osteoarthritis of the knee (Kellgren-Lawrence grade 1-3) isolated to one compartment, usually the medial side.
- Varus mis-alignment in medial unicompartmental osteoarthritis of the knee, as this is the main indication for high tibial osteotomy (HTO).
- Valgus mis-alignment in lateral unicompartmental osteoarthritis of the knee, as this is the main indication for distal femoral osteotomy (DFO)
- In younger patients as the outcome for partial or total knee replacement is not as successful as in older patients.

The decision as to whether patients should have high tibial osteotomy rather than UKR or TKR remains a clinical one as good comparative evidence is not available.

■ Surgical option: *Arthroscopy*

Knee arthroscopy, lavage and debridement should NOT be offered for patient with non-mechanical symptoms of pain and stiffness (3) (32).





Knee arthroscopy, lavage and debridement should only be considered in patients (3) (32) (33) (34):

- With clear history of mechanical symptoms e.g. locking that have not responded to at least 3 months of non-surgical treatment.
- Where a detailed understanding of the degree of compartment damage within the knee is required, above that demonstrated by imaging, when considering patients for certain surgical interventions (e.g. high tibial osteotomy).

With all surgical options, an enhanced recovery programme should be in place in all providers.

### ***Postoperative care***

All patients should be seen within 6 weeks of their surgical procedure, receiving feedback about their treatment. Various service designs could be considered to deliver this, including a virtual clinic.

All patients should receive targeted physiotherapy after knee replacement or osteotomy. Routine patients may require up to 6 sessions of physiotherapy. Patients with significant co-morbidities will have greater needs and will require longer rehabilitation support.

Patients should be followed up in the first year, once at seven years and three yearly thereafter in asymptomatic patients. Telephone or web-based Patient Reported Outcome Measures (PROMS) may be useful to monitor outcome (e.g. virtual clinics). Radiographs, reported by radiologists with musculoskeletal interest, are essential as imaging identifies failure better than symptoms. Routine follow up in General Practice is not advised; where complications are identified by patient contacts in primary care, referral back to the original surgical team should be made possible.

Novel or modified implants should be introduced conforming with the Beyond Compliance principles with increased follow-up - usually annually for the first five years, two yearly to ten and three yearly thereafter.

Provider surgeons should consent and enter knee replacement patients onto the National Joint Register (NJR) and Provider organisations should collect PROMS.

## **1.4 Secondary Care: Specialised Surgery**

Certain types of primary joint surgery to treat patients with osteoarthritis of the knee require specialised facilities. These types of cases include patients presenting with:

- Severe bone loss
- Extreme deformity
- Post trauma/fracture OA with anatomy disorganised
- Joint surgery for OA in very young patients (<40)
- Prior joint fusion

This complex work is similar in nature to complex revision surgery (second revision and revision for infection). These surgeries are currently commissioned by NHS England directly.

## 2 Procedures Explorer for Painful Osteoarthritis of the Knee

Users can access further procedure information based on the data available in the quality dashboard to see how individual providers are performing against the indicators. This will enable CCGs to start a conversation with providers who appear to be 'outliers' from the indicators of quality that have been selected.

The Procedures Explorer Tool is available via the [Royal College of Surgeons](#) website. Commissioners should be aware of the Getting it Right First Time data that will be increasingly used within Orthopaedic units. This data sits alongside the data in the Procedure Explore Tool, and does not conflict with it, but is expected by the BOA to become more routinely used for quality improvement of the surgical care relevant to this pathway.

(ICD10 codes: M17.0, M17.1, M17.2, M17.3, M17.4, M17.5, M17.6, M17.7, M17.8, M17.9)

Procedure	OPCS4 codes*
<b>Total Knee Replacement</b>	W40.1, W40.8, W40.9, W41.1, W41.8, W41.9, W42.1, W42.8, W42.9
<b>Partial Knee replacement</b>	W52.1, W52.8, W52.9, W53.1, W53.8, W53.9, W54.1, W54.8, W54.9
<b>Knee Osteotomy</b>	W1660, W16X, W12X
<b>Knee arthroscopy</b>	W82, W83, W85, W87, W89, W91,

## 3 Dashboard for Painful Osteoarthritis of the Knee

The quality dashboard provides an overview of activity commissioned by CCGs from the relevant pathways, and indicators of the quality of care provided by surgical units.

The quality dashboard is available via the [Royal College of Surgeons](#) website.

*For current dashboard indicators (see appendix 1)*

Measure	Definition	Data Source*
<b>1. Standardised activity rate</b>	Activity rate standardised for age and sex	HES/ Quality Dashboard appendix 1
<b>2. Average length of stay</b>	Total spell duration/total number of patients discharged	HES/ Quality Dashboard appendix 1
<b>3. Day case rate</b>	Number of patients admitted and discharged on the same day/total number of patients discharged	HES/ Quality Dashboard appendix 1
<b>4. Short stay rate</b>	Number of patients admitted and discharged within 48 hours/total number of patients discharged	HES/ Quality Dashboard appendix 1

<b>5. 7/30 day readmission rate</b>	Number of patients readmitted as an emergency within 7/30 days of discharge/total number of patients discharged (Excludes Cancer, dementia, mental health)	HES/ Quality Dashboard appendix 1
<b>6. Reoperations within 30 days/1 year</b>	Number of patients re-operated during an emergency readmission within 30 days/1 year/total number of patients discharged	HES/ Quality Dashboard appendix 1
<b>7. In hospital mortality rate</b>	Number of patients who die while in hospital/total number of patients discharged	HES/ Quality Dashboard appendix 1

*Areas for development of dashboard in future:*

<b>Measure</b>	<b>Evidence Base</b>	<b>Data Source*</b>
<b>PROM (OKS) change at 6 months post-surgery for TKA</b>	National data set	The Health and Social Care Information Centre
<b>Enhanced recovery programme for TKA</b>	HES data set	HES
<b>Rate of blood transfusion in TKA</b>	BOA Guidance on Blood-transfusion in orthopaedic Surgery	Providers
<b>Uptake of pre-operation antibiotics at surgery for TKA</b>	BASK optimal patient management guide (Blue Book)	Providers
<b>Infection rate (TKA)</b>	HES data set	Providers
<b>Uptake of thromboprophylaxis with TKA</b>	NICE	VERITY, Providers

\* includes data from HES, National Clinical Audits, Registries

## 4 Levers for Implementation

### 4.1 Audit and Peer Review Measures

Levers for implementation are tools for commissioners and providers to aid implementation of high value care pathways.

Measure	Standard	Data obtained from:
<b>Adherence to NICE Guidance for referral</b>	Percentage of people referred to secondary care for whom core treatments options engaged with	Local use of referral checklist/tool Audit
	Proportion of patients engaging in shared decision making, measured as far as practical (possibly qualitatively)	Peer review through GP Quality Outcomes Framework QP indicators
<b>Shared Decision Making</b>	Self-reported outcome measures such as CollaborATE and SURE (AQuA)	
<b>Change in PROMs score for TKA</b>	A centre should demonstrate acceptable PROMs outcome	National PROMs data
<b>Enhanced Recovery (ER)</b>	Number of patients cared for along an Enhanced Recovery Care Pathway	Performance on national ER indicators

### 4.2 Quality Specification/CQUIN (Commissioning for Quality and Innovation)

Measure	Description	Data specification
Infection rate in TKA	<1%	HES data, SSI data
Enhanced recovery programme	Clearly defined ERP in place within hospital	Hospital data
Uptake of appropriate thromboprophylaxis	100% compliance	VERITY, Hospital data
WHO checklist	100% compliance	Hospital data

## 5 Directory

### 5.1 Patient Information for Painful Osteoarthritis of the Knee

Name	Publisher	Link
NHS Choices Osteoarthritis	NHS	<a href="http://www.nhs.uk/conditions/osteoarthritis/Pages/Introduction.aspx">http://www.nhs.uk/conditions/osteoarthritis/Pages/Introduction.aspx</a>
NHS Evidence	NHS	<a href="http://www.evidence.nhs.uk">www.evidence.nhs.uk</a> <a href="https://www.arthritiscare.org.uk/what-is-arthritis/types-of-arthritis/62-osteoarthritis">https://www.arthritiscare.org.uk/what-is-arthritis/types-of-arthritis/62-osteoarthritis</a>
Arthritis Care	Arthritis Care	<a href="https://www.arthritiscare.org.uk/what-is-arthritis/types-of-arthritis/62-osteoarthritis">https://www.arthritiscare.org.uk/what-is-arthritis/types-of-arthritis/62-osteoarthritis</a>

### 5.2 Clinician Information for Painful Osteoarthritis of the Knee

Name	Publisher	Link
NHS Evidence	NHS	<a href="http://www.evidence.nhs.uk">www.evidence.nhs.uk</a>
NICE Guidance	NICE	<a href="http://www.nice.org.uk/CG59">www.nice.org.uk/CG59</a>

## 6 Benefits and Risks

*Benefits and risks of commissioning the pathway are described below:*

Consideration	Benefit	Risk
<b>Patient outcome</b>	Ensure access to effective conservative, medical and surgical therapy	Prolonged treatment with patients disabled and dependent, unable to work if of working age
<b>Patient safety</b>	Reduce chance of missing serious knee pathology	
<b>Patient experience</b>	Improve access to patient information.	Patients not taking charge of their care, dependence on Primary and Secondary care
<b>Equity of access</b>	Improve access to effective procedures	With-holding of access for financial reasons alone
<b>Resource impact</b>	Reduce unnecessary investigation, referral and intervention	Resource required to establish community specialist provider

## 7 Further Information

### 7.1 Research Due for Publication

1. The ACHE trial: an evaluation of symptoms scoring systems to guide referral and management of patients with osteoarthritis who are being considered for surgery.
2. Comparison of partial replacement versus total knee replacement (NIHR HTA TOPKAT Trial).

### 7.2 Research Recommendations

1. Effectiveness of non-surgical treatments.
2. Effectiveness of non-replacement surgery for the arthritic knee (e.g. HTO).
3. Comparison of partial replacement versus HTO.
4. Development of cost-effective surveillance of patients after their joint replacement.
5. Evaluation of the use of intra-articular injection of corticosteroid in GP practices.
6. The role of MSK-HQ in evaluating this pathway.

### 7.3 Other Recommendations

1. Improved patient Information, to support improved shared decision making.
2. Improve clinician education, in particular with reference to shared decision making.
3. Mandatory data collection in hospitals.
4. Separation of co-morbidity from complication from IC CC list.

### 7.4 Evidence Base

1. AR-UK. Data on osteoarthritis of the knee via: <http://www.arthritisresearchuk.org/arthritis-information/data-and-statistics/data-by-condition/osteoarthritis/data-on-knee-oa.aspx>
2. Skou, S. T., et al. (2015). "A Randomized, Controlled Trial of Total Knee Replacement."

The New England journal of medicine 373(17):1597-1606.

3. NICE. CG117: Osteoarthritis-The care and management of osteoarthritis in adults-In Progress. London: National Institute for Health and Clinical Excellence (NICE), 2014.

4. Culliford DJ, Maskell J, Beard DJ, et al. Temporal trends in hip and knee replacement in the United Kingdom: 1991 to 2006. *J Bone Joint Surg Br* 2010; 92(1):130-5.
5. NHS. Provisional Monthly Patient Reported Outcome Measures (PROMs) in England. April 2009-April 2010: Pre-and postoperative data: Experimental statistics. HES On Line. In: Health and Social Care Information Centre DoH, ed. Leeds: Hospital Episode Statistics, 2010.
6. NJR. 9th Annual Report of the UK NJR.
7. Dakin H, Gray A, Fitzpatrick R, et al. Rationing of total knee replacement: a cost-effectiveness analysis on a large trial data set. *BMJ Open* 2012; 2(1):e000332.
8. Baker PN, Jameson SS, Deehan DJ, et al. Mid-term equivalent survival of medial and lateral unicompartmental knee replacement: An analysis of data from a National Joint Registry. *J Bone Joint Surg Br* 2012; 94(12):1641-8.
9. Robertsson O, Knutson K, Lewold S, et al. The routine of surgical management reduces failure after unicompartmental knee arthroplasty. *J Bone Joint Surg Br* 2001; 83(1):45-9.
10. Bennell KL, Hunter DJ, Hinman RS. Management of osteoarthritis of the knee. *BMJ* 2012; 345:e4934.
11. NICE. CG117: Osteoarthritis-The care and management of osteoarthritis in adults-In Progress. London: National Institute for Health and Clinical Excellence (NICE), 2014.
12. Henriksen, M., et al. (2014). "Association of exercise therapy and reduction of pain sensitivity in patients with knee osteoarthritis: A randomized controlled trial." *Arthritis Care and Research* 66(12): 1836-1843.
13. Abbott, J. H., et al. (2013). "Manual therapy, exercise therapy, or both, in addition to usual care, for osteoarthritis of the hip or knee: A randomized controlled trial. 1: Clinical effectiveness." *Osteoarthritis and Cartilage* 21(4): 525-534.
14. Henriksen, M., et al. (2015). "Exercise versus analgesics for knee osteoarthritis pain: A meta-epidemiological study of cochrane systematic reviews." *Osteoarthritis and Cartilage* 23: A172.
15. Zacharias, A., et al. (2014). "Efficacy of rehabilitation programs for improving muscle strength in people with hip or knee osteoarthritis: a systematic review with meta-analysis." *Osteoarthritis and Cartilage* 22(11): 1752-1773.
16. Ulthman, O. A., et al. (2013). "Exercise for lower limb osteoarthritis: systematic review incorporating trial sequential analysis and network meta-analysis." *BMJ* 347:f5555.
17. Christensen, R., et al. (2015). "Effect of weight maintenance on symptoms of knee osteoarthritis in obese patients: A twelve-month randomized controlled trial." *Arthritis Care and Research* 67(5): 640-650.
18. Callaghan, M. J., et al. (2015). "A randomised trial of a brace for patellofemoral osteoarthritis targeting knee pain and bone marrow lesions." *Annals of the Rheumatic Diseases* 74(6): 1164-1170. René JFM, Marcel GMOR, Stuart GP, et al. What is intermediate care? *BMJ* 2004; 329 (7462): 360-61.

19. Guermazi A, Niu J, Hayashi D, et al. Prevalence of abnormalities in knees detected by MRI in adults without knee osteoarthritis: population based observational study (Framingham Osteoarthritis Study). *BMJ* 2012; 345:e5339.
20. Dieppe P, Lim K, Lohmander S. Who should have knee joint replacement surgery for osteoarthritis? *Int J Rheum Dis* 2011; 14(2):175-80.
21. Carr AJ, Robertsson O, Graves S, et al. Knee replacement. *Lancet* 2012; 379 (9823):1331-40.
22. Baker PN, Petheram T, Jameson SS, et al. Comparison of patient-reported outcome measures following total and unicompartmental knee replacement. *J Bone Joint Surg Br* 2012; 94(7):919-27.
23. Liddle, A. D., et al. (2015). "Patient-reported outcomes after total and unicompartmental knee arthroplasty: A study of 14 076 matched patients from the national joint registry for England and Wales." *Bone and Joint Journal* 97-B(6):793-801.
24. Hunt, L. P., et al. (2014). "45-day mortality after 467,779 knee replacements for osteoarthritis from the National Joint Registry for England and Wales: an observational study." *Lancet* 384(9952):1429-1436.
25. Liddle et al (2014). "Adverse outcomes after total and unicompartmental knee replacement in 101 330 matched patients: a study of data from the National Joint Registry for England and Wales." *Lancet* 2014; 384:1437-45.
26. Price AJ, Webb J, Topf H, et al. Rapid recovery after oxford unicompartmental arthroplasty through a short incision. *J Arthroplasty* 2001; 16(8):970-6.
27. Morris MJ, Molli RG, Berend KR, et al. Mortality and perioperative complications after unicompartmental knee arthroplasty. *Knee* 2013; 20(3):218-20.
28. Brinkman JM, Lobenhoffer P, Agneskirchner JD, et al. Osteotomies around the knee: patient selection, stability of fixation and bone healing in high tibial osteotomies. *J Bone Joint Surg Br* 2008; 90(12):1548-57.
29. Floerkemeier S, Staubli AE, Schroeter S, et al. Outcome after high tibial open-wedge osteotomy: a retrospective evaluation of 533 patients. *Knee surgery, sports traumatology, arthroscopy: official journal of the ESSKA* 2013;21(1):170-80.
30. McNamara I, Birmingham TB, Fowler PJ, et al. High tibial osteotomy: evolution of research and clinical applications--a Canadian experience. *Knee Surg Sports Traumatol Arthrosc* 2013; 21(1):23-31.
31. Brouwer RW, Raaij van TM, Bierma-Zeinstra SM, et al. Osteotomy for treating knee osteoarthritis. *Cochrane Database Syst Rev* 2007(3):CD004019.
32. NICE. Arthroscopic knee washout, with or without debridement, for the treatment of osteoarthritis: guidance (IPG230) 2007.
33. Reichenbach S, Rutjes AW, Nuesch E, et al. Joint lavage for osteoarthritis of the knee. *Cochrane Database Syst Rev* 2010(5):CD007320.





34. Laupattarakasem W, Laopaiboon M, Laupattarakasem P, et al. Arthroscopic debridement for knee osteoarthritis. Cochrane Database Syst Rev 2008(1):CD005118.



## 7.5 Guide Development Group for Painful Osteoarthritis of the Knee

A commissioning Guide Development Group was established to review and advise on the content of the commissioning guide. This group met on a number of occasions via teleconference, with additional interaction taking place via email. Details of the Guide Development Group involved in the original production of the guide is available on request.

Name	Job Title/Role	Affiliation
Andrew Price (Chairman)	Professor of Orthopaedic Surgery	BASK , BOA
Donald McBride	Consultant Orthopaedic Surgeon	BOA Executive
Kate Brown	Director of Planning and Primary Care Development	NHS Southern Derbyshire Clinical Commissioning Group
Margaret Hughes	Patient Representative	BOA PLG
Peter Devlin	General Practitioner	Sussex MSK Partnership
Karen Barker	Clinical Director for Orthopaedics (Physiotherapist)	Nuffield Orthopaedic Centre, Oxford
Derek Twigg	Patient representative	BOA PLG
Liz Lawrence	Head of Transformation, Primary and Community Services	NHS Southern Derbyshire Clinical Commissioning Group

## 7.6 Funding Statement

The development of this commissioning guidance has been funded by the following sources:

- The Royal College of Surgeons of England (RCSEng) and the British Orthopaedic Association (BOA) provided staff to support the guideline development.

## 7.7 Methods Statement

The development of this guidance has followed a defined, NICE Accredited process. This included a systematic literature review, public consultation and the development of a Guide Development Group which included those involved in commissioning, delivering, supporting and receiving surgical care as well as those who had undergone treatment. An essential component of the process was to ensure that the guidance was subject to peer review by senior clinicians, commissioners and patient representatives. Details are available on this site:

<http://www.rcseng.ac.uk/healthcare-bodies/nscc/commissioning-guides>



## 7.8 Conflict of Interest Statement

Individuals involved in the development and formal peer review of commissioning guides are asked to complete a conflict of interest declaration. It is noted that declaring a conflict of interest does not imply that the individual has been influenced by his or her secondary interest, but this is intended to make interests (financial or otherwise) more transparent and to allow others to have knowledge of the interest.

# Appendix 1: Dashboard

To support the commissioning guides the Quality Dashboards show information derived from Hospital Episode Statistics (HES) data. These dashboards show indicators for activity commissioned by CCGs across the relevant surgical pathways and provide an indication of the quality of care provided to patients.

The dashboards (<http://rcs.methods.co.uk/dashboards.html>) are supported by a meta data (<http://rcs.methods.co.uk/metadata.html>) document to show how each indicator was derived.



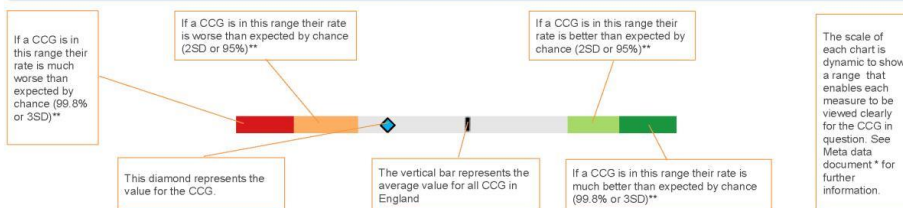
## Created and maintained by Methods Insight Analytics in association with BOA Rightcare Surgical Commissioning Dashboard: Orthopaedics

The Right Care Dashboard provides rates of Activity for CCGs for interventions identified as a priority by the surgical specialist association. These rates are directly standardised against the national population for Age and Sex. This dashboard supports the Painful Osteoarthritis of the Hip commissioning guidance document developed by the BOA working group with the RCSE.

### Report Overview

Intervention Name	Indicator name*	Period	Value	National Mean	Chart	Trend
Hip resurfacing	Activity rate per 100,000 population (DSR)	RY Q3 1213	0.36	3.97	[Sparkline]	[Trend]
	Average Length of Stay (Days)	RY Q3 1213	3.00	3.44	[Sparkline]	[Trend]
	7 Day Re-admission rate (%)	RY Q3 1213	0.00%	0.00%	[Sparkline]	[Trend]
	36 Day Re-admission rate (%)	RY Q3 1213	0.00%	0.20%	[Sparkline]	[Trend]
	Re-operations within 36 Days (%)	RY Q3 1213	0.00%	0.45%	[Sparkline]	[Trend]
	Day case rate (%)	RY Q3 1213	0.00%	0.59%	[Sparkline]	[Trend]
	In Hospital Mortality Rate (per 1,000 provider spells)	RY Q3 1213	0.00	0.00	[Sparkline]	[Trend]

### How to interpret charts



The chart on the left shows a CCG whose performance on this indicator is better than the national picture by a degree that is unlikely to be explained by random chance\*\*

The two charts on the left shows a CCG whose performance on this indicator does not differ from the national picture by more than can be explained by random chance\*\*

The chart on the left shows a CCG whose performance on this indicator is worse than the national picture by a degree that is unlikely to be explained by random chance\*\*

The chart on the left is for an indicator that does not have a desired direction for improvement. The CCG shown in this example is within the expected range based on the national picture.

\* For a full description of each metric and metadata, please see technical guidance.

\*\* These charts are constructed using statistical process control (SPC) principles and use control limits to indicate variation from the national mean. The display shows both two standard deviation (95%) control limits and three standard deviation (99.8%) control limits. Values within these limits (the light grey section) are said to display 'normal cause variation' in that variation from the mean can be considered to be random. Values outside these limits (in the light green or orange sections) are said to display 'special cause variation' at a two standard deviation level, and a cause other than random chance should be considered. Values outside these sections (in the dark green or red sections) also display 'special cause variation' but against a more stringent test.

Variation at the two standard deviation level can be considered to raise an alert, and variation at the three standard deviation level to raise an alarm.

## Example CCG

### Orthopaedics-Painful Osteoarthritis of the Knee

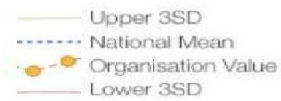
#### Arthroscopy

Metric	Period	Value	Mean	Chart	Trend
Age/Sex Standardised Activity (per 100,000 population)	RY Q4 1213	32.85	81.11		
Average Length of Stay (Days)	RY Q4 1213	0.16	0.12		
7 Day Readmission Rate (%)	RY Q4 1213	0.00	0.41		
30 Day Readmission Rate (%)	RY Q4 1213	1.20	1.24		
30 Day Reoperation Rate (%)	RY Q4 1213	1.20	0.71		
Daycase Rate (%)	RY Q4 1213	36.85	30.67		
In Hospital Mortality Rate (per 1,000 discharges)	RY Q4 1213	0.00	0.00		

#### Chart



#### Trend



#### Partial knee replacement

Metric	Period	Value	Mean	Chart	Trend
Age/Sex Standardised Activity (per 100,000 population)	RY Q4 1213	6.14	16.89		
Average Length of Stay (Days)	RY Q4 1213	4.60	3.36		
7 Day Readmission Rate (%)	RY Q4 1213	0.00	0.50		
30 Day Readmission Rate (%)	RY Q4 1213	0.00	1.52		
30 Day Reoperation Rate (%)	RY Q4 1213	0.00	1.03		
Daycase Rate (%)	RY Q4 1213	0.00	0.52		
In Hospital Mortality Rate (per 1,000 discharges)	RY Q4 1213	0.00	0.00		

#### Total knee replacement

Metric	Period	Value	Mean	Chart	Trend
Age/Sex Standardised Activity (per 100,000 population)	RY Q4 1213	117.60	107.50		
Average Length of Stay (Days)	RY Q4 1213	5.59	5.06		
7 Day Readmission Rate (%)	RY Q4 1213	2.88	1.73		
30 Day Readmission Rate (%)	RY Q4 1213	6.02	4.78		
30 Day Reoperation Rate (%)	RY Q4 1213	2.62	2.68		
Daycase Rate (%)	RY Q4 1213	0.00	0.20		
In Hospital Mortality Rate (per 1,000 discharges)	RY Q4 1213	2.62	0.78		

