NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

INTERVENTIONAL PROCEDURES PROGRAMME

Interventional procedure overview of arthroscopic knee washout, with or without debridement, for the treatment of osteoarthritis

Osteoarthritis of the knee can cause pain, stiffness, swelling and difficulty in walking. An arthroscopic knee washout involves flushing the joint with fluid, which is introduced through small incisions in the knee. The procedure is often done with debridement, which is the removal of debris around the joint.

Introduction

This overview has been prepared to assist members of the Interventional Procedures Advisory Committee (IPAC) in making recommendations about the safety and efficacy of an interventional procedure. It is based on a rapid review of the medical literature and specialist opinion. It should not be regarded as a definitive assessment of the procedure.

Date prepared

This overview was prepared in September 2006.

Procedure name

- Arthroscopic knee washout (lavage) with or without debridement

Specialty societies

- British Orthopaedic Association
- British Association for Surgery of the Knee

Description

Indications

Arthroscopic washout is used to treat osteoarthritis of the knee. Osteoarthritis of the knee is the result of progressive degeneration of the cartilage of the joint surface.

Current treatment and alternatives

Treatment options depend on the severity of the osteoarthritis. The condition is usually chronic, and patients may have several treatment strategies applied at different stages. Conservative treatments include medications to relieve pain and inflammation, and physiotherapy / prescribed exercise. If there is a knee-joint effusion, fluid around the knee may be aspirated with a needle (arthrocentesis) to reduce pain and swelling. Corticosteroids or Hyaluronic acid may be injected into the knee joint. If these therapies do not work, a knee-replacement operation may be necessary.

What the procedure involves

Arthroscopic washout (lavage) of the knee is usually performed under general anaesthesia. A small incision is made in the knee and saline is pumped into the joint space to facilitate visualisation. A narrow fibreoptic telescope (arthroscope), attached to a video camera is inserted through a second small incision. Saline is then introduced via an arthroscopic cannula to wash the joint out. Some loose debris may be flushed out through the cannula along with the fluid, but no instruments are used to remove tissue. Debridement is often performed at the same time as washout; this involves the use of instruments to remove damaged cartilage or bone. At the end of the procedure, the saline is drained out of the joint and the incisions are closed with stitches.

Efficacy

Specialist Advisers stated that there is uncertainty about the efficacy of this procedure. They listed the key efficacy outcomes as relief of pain and reduction of mechanical symptoms.

The efficacy evidence in this overview relates to six randomised controlled trials (RCTs), one non-randomised controlled trial and three case series.

Pain and function

One RCT of 180 patients reported that there were no significant differences between arthroscopic lavage, debridement or placebo (simulated arthroscopy) in terms of pain relief or knee function at 2 years.[1] A second RCT that compared debridement with washout reported that 59% (19/32) of patients in the debridement group were pain-free at 5 years, compared with 12% (3/26) of patients in the washout group (p value not stated).[2] A third RCT of 90 patients reported that pain relief at 12 months was significantly better in patients receiving 3 litre washout compared with patients receiving 0.25 litre washout ($p = 0.02$). However, there was no significant difference between the groups in joint stiffness or function.[3] An RCT of 32 patients found no significant difference between arthroscopic and closed-needle washout in terms of clinical or functional outcomes at 12 months.[4] An RCT of 38 patients comparing hyaluronic acid injections with arthroscopic washout reported no significant differences in pain or function at 1 year.[5]

Further interventions

In one case series of 121 patients, 10% (12/121) required repeat arthroscopy and 12% (15/121) required replacement arthroplasty after a follow-up of 4–6 years.[7] In another case series, 18% (18/100) of knees required further surgery after 5 years' follow-up (4 osteotomies, 3 unicondylar arthroplasties and 11 total knee replacements).[8] A third case series reported that 23% (47/204) of knees required further surgery after a mean follow-up of 7.4 years, including 25 joint arthroplasties.[9]

Safety

Specialist Advisers did not express any major safety concerns. They stated that theoretical adverse events include a small risk of infection and thromboembolism.

Few complications were reported in any of the studies. In one case series of 204 patients, haemarthrosis requiring aspiration occurred after 2% (4/204) of procedures and there was one case of deep venous thrombosis (0.5%).[9]

Literature review

Rapid review of literature

The medical literature was searched to identify studies and reviews relevant to arthroscopic washout of the knee. Searches were conducted via the following databases, covering the period from their commencement to June 2006: Medline, PreMedline, EMBASE, Cochrane Library and other databases. Trial registries and the Internet were also searched. No language restriction was applied to the searches. (See appendix C for details of search strategy.)

The following selection criteria (Table 1) were applied to the abstracts identified by the literature search. Where these criteria could not be determined from the abstracts the full paper was retrieved.

Table 1 Inclusion criteria for identification of relevant studies

Characteristic	Criteria
Publication type	Clinical studies were included. Emphasis was placed on identifying good quality studies. Abstracts were excluded where no clinical outcomes were reported, or where the paper was a review, editorial, laboratory or animal study. Conference abstracts were also excluded because of the difficulty of appraising methodology.
Patient	Patients with arthritis of the knee
Intervention/test	Arthroscopic knee washout
Outcome	Articles were retrieved if the abstract contained information relevant to the safety and/or efficacy. Key efficacy outcomes included: • pain and physical functioning scores • need for further surgery
Language	Non-English-language articles were excluded unless they were thought to add substantively to the English-language evidence base.

List of studies included in the overview

This overview is based on five RCTs, one non-randomised controlled trial and three case series.[1–9]

Other studies that were considered to be relevant to the procedure but were not included in the main extraction table (table 2) have been listed in appendix A.

Existing reviews on this procedure

A systematic review on arthroscopic washout (lavage) for osteoarthritis of the knee was published in 2003.[10] The review identified five RCTs (one of which was considered to be good quality) and two non-randomised studies. The review concluded from the RCTs that there was no evidence that arthroscopic washout or debridement improves patient-reported pain, function or disability compared with non-arthroscopic treatments. Four of the RCTs included in the review have been summarised in table 2.[1,2,3,4] The remaining trial was only published as an abstract and is listed in appendix A.

A second systematic review was published in 2005.[11] The review identified four RCTs, three of which were included in the previous review; one was a more recent publication. The review concluded that there was insufficient evidence to compare the clinical effects of arthroscopic lavage and other treatments for osteoarthritis of the knee. Although none of the trials found a significant effect, small sample sizes and methodological weaknesses made it difficult to conclude that effects were truly absent. The additional RCT included in this review has been summarised in table 2.[5]

Related NICE guidance

Below is a list of NICE guidance related to this procedure. Appendix B details the recommendations made in each piece of guidance listed below.

Interventional procedures

- Mini-incision surgery for total knee replacement. *NICE Interventional Procedure Guidance* (March 2005).
  See www.nice.org.uk/page.aspx?o = 207031for further information.

Technology appraisals

None relevant to procedure

Clinical guidelines

- Osteoarthritis: the care and management of adults with osteoarthritis. *NICE clinical guideline*. (Publication expected December 2007.) Consultation on draft of guideline with stakeholders is expected July–September 2007.
  See www.nice.org.uk/page.aspx?o=207031 for further information.
- Rheumatoid arthritis in adults. *NICE clinical guideline.* (Publication expected December 2008.)
  See www.nice.org.uk/page.aspx?o=360017 for further information.

Public health

None relevant to procedure

Table 2 Summary of key efficacy and safety findings on arthroscopic knee washout

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

<table>
<tr><th>Study details</th><th>Key efficacy findings</th><th>Key safety findings</th><th>Comments</th></tr>
<tr>
<td>
Moseley JB et al (2002)[1]

Randomised controlled trial

USA

Study period: 1995–1998

n = 180 patients

Population: Patients with osteoarthritis of the knee
• 33% (59/180) = arthroscopic debridement
• 34% (61/180) = arthroscopic lavage
• 33% (60/180) = placebo surgery

<table>
<tr><th></th><th>Debride-ment (with lavage)</th><th>Lavage</th><th>Placebo</th></tr>
<tr><td>Mean age (years)</td><td>53.6</td><td>51.2</td><td>52.0</td></tr>
<tr><td>Male (%)</td><td>96.6</td><td>88.5</td><td>93.3</td></tr>
</table>

Indications: Inclusion criteria included age ≤ 75 years; osteoarthritis of the knee as defined by the ACR; at least moderate knee pain on average (≥ 4 on 0–10 VAS) despite maximal medical treatment for at least 6 months; no knee arthroscopy in previous 2 years.
Exclusion criteria: Severity grade 9 or higher (severity of disease in each compartment assessed radiographically on a scale of 0–4 and added together to generate a severity score 0–12), severe deformity, serious medical problems.
</td>
<td>
Need for further surgery
No data reported.

Mean values on KSPS 1 and 2 years after procedure (range 0–100, higher scores indicate more severe pain):
<table>
<tr><th></th><th>Debride-ment (with lavage)</th><th>Lavage</th><th>Placebo</th></tr>
<tr><td>1 year (n = 160)</td><td>51.7 ± 22.4</td><td>54.8 ± 19.8</td><td>48.9 ± 21.9</td></tr>
<tr><td>2 years (n = 164)</td><td>51.4 ± 23.2</td><td>53.7 ± 23.7</td><td>51.6 ± 23.7</td></tr>
</table>
At 1 year, placebo vs lavage, p = 0.14; placebo vs debridement, p = 0.51
At 2 years, placebo vs lavage, p = 0.64; placebo vs debridement, p = 0.96

Mean scores on the pain subscale of the AIMS (range 0–100, higher scores indicate more severe pain)
<table>
<tr><th></th><th>Debride-ment (with lavage)</th><th>Lavage</th><th>Placebo</th></tr>
<tr><td>Before surgery (n = 178)</td><td>59.3 ± 22.2</td><td>59.3 ± 16.7</td><td>59.5 ± 18.5</td></tr>
<tr><td>1 year (n = 162)</td><td>53.3 ± 25.4</td><td>57.8 ± 23.5</td><td>53.6 ± 22.1</td></tr>
<tr><td>2 years (n = 164)</td><td>54.0 ± 23.3</td><td>56.7 ± 24.1</td><td>52.5 ± 25.1</td></tr>
</table>
At 1 year, placebo vs lavage, p = 0.34; placebo vs debridement, p = 0.95
At 2 years, placebo vs lavage, p = 0.37; placebo vs debridement, p = 0.75
</td>
<td>
The paper states that there were two minor complications in total (one incisional erythema treated with antibiotics; one calf swelling that was not due to thrombosis).
</td>
<td>
Of the 324 consecutive patients who met the criteria for inclusion, 44% (144) declined to participate.

Participants were significantly younger than those who declined (52.3 vs 55.3 years, p = 0.002), were more likely to be white (62 vs 51%, p = 0.03) and had more severe arthritis (25% vs 12.5% with grade 7 or 8 arthritis, p < 0.001).

Study was conducted at a Veteran Affairs medical centre, so most participants were men.

Severity of osteoarthritis was assessed radiographically and scored 0–12. Proportions of mild, moderate and severe disease were similar between the three study groups.

Participants were stratified according to severity of osteoarthritis and a stratified randomisation process was used. Patients and postoperative assessors were blinded to treatment allocation. One surgeon performed all procedures. The report states that patients in the placebo group were no more likely than patients in the other two groups to guess that they had undergone a placebo procedure.
</td>
</tr>
</table>

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

<table>
<tr><th>Study details</th><th>Key efficacy findings</th><th>Key safety findings</th><th>Comments</th></tr>
<tr>
<td>Moseley JB et al (2002) continued

Technique: Any mechanically important tears encountered in the lavage group were treated. Debridement also included lavage. Patients in lavage or debridement groups received general anaesthetic, patients in placebo group received short-acting intravenous tranquiliser and an opioid. Standard debridement procedure was simulated in placebo group; three incisions were made in the skin but no instruments were inserted.

Follow-up = 2 years

Conflict of interest: none stated.</td>
<td>Mean scores on physical functioning scale (number of seconds patient took to walk 30 m and to climb up and down a flight of stairs as quickly as possible; longer times indicate poorer functioning)

<table>
<tr><th></th><th>Debride-ment (with lavage)</th><th>Lavage</th><th>Placebo</th></tr>
<tr><td>Before surgery (n = 176)</td><td>52.1 ± 20.2</td><td>50.0 ± 14.3</td><td>48.5 ± 14.5</td></tr>
<tr><td>1 year (n = 150)</td><td>52.5 ± 20.3</td><td>50.4 ± 17.6</td><td>45.6 ± 10.2</td></tr>
<tr><td>2 years (n = 138)</td><td>52.6 ± 16.4</td><td>53.2 ± 21.6</td><td>47.7 ± 12.0</td></tr>
</table>
At 1 year, placebo vs lavage, p = 0.09; placebo vs debridement, p = 0.04
At 2 years, placebo vs lavage, p = 0.13; placebo vs debridement, p = 0.11</td>
<td></td>
<td>The self-reported KSPS was created specifically for this study.

The paper states that 165 patients (92%) completed the trial but a complete set of results were not presented for all of these patients.</td>
</tr>
</table>

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

Study details	Key efficacy findings	Key safety findings	Comments
Hubbard MJS (1996)[2] **Randomised controlled trial** UK Study period: 1985–1989 **n = 76 knees** Population: Patients undergoing arthroscopic surgery for degeneration of the articular cartilage of the knee • 53% (40/76) = arthroscopic debridement • 47% (36/76) = arthroscopic washout Indications: Inclusion criteria included symptoms > 1 year; no laxity; no deformity; single medial femoral condyle degenerative lesion grade 3 or 4 (Outerbridge classification); no other intra-articular pathology; normal plain radiograph; modified Lysholm score (without score for stability) < 38/70. Exclusion criteria: Loss of joint space on radiograph; previous operation on knee or steroid injection for any reason. Technique: Debridement included resection of loose cartilage using straight and curved punches; 3 litres saline were run through the knee after debridement. In the washout group, 3 litre saline were run through the knee. **Mean follow-up:** • Debridement = 4.5 years • Washout = 4.3 years Conflict of interest: none stated	**Need for further surgery** No data reported. Absence of pain at 1 year: • debridement = 80% (32/40) • washout = 14% (5/36) p = 0.05 Absence of pain at 5 years: • debridement = 59% (19/32) • washout = 12% (3/26) p = not stated Mean improvement in modified Lysholm score (modified to exclude score for stability) at 1 year: • debridement = 28 • washout = 5 p = not stated at 5 years: • debridement = 21 • washout = 4 p = not stated	No complications were described.	Randomisation described. All patients were reviewed by a single investigator who was aware of treatment allocation. It is unclear whether patients were blinded. 76% (58/76) knees were available for analysis at 5-year follow-up. Eight patients (20%) in the debridement group were lost to follow-up at 5 years, all with 'success' reported at their latest review (this was not defined further). Ten patients (28%) in the washout group were lost to follow-up.

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

<table>
<tr><th>Study details</th><th>Key efficacy findings</th><th>Key safety findings</th><th>Comments</th></tr>
<tr>
<td>Kalunian KC et al (2000)[3]

Randomised controlled trial

USA and Canada

Study period: not stated

n = 90 patients

Population: Patients with early knee osteoarthritis
• 46% (41/90) = 3 litre washout (mean age = 61 years, male = 46%)
• 54% (49/90) = 0.25 litre washout (controls) (mean age = 58 years, male = 47%)

Indications: Inclusion criteria included age > 40 years; knee pain ≤ 10 years; unsatisfactory pain relief despite at least 6 weeks' supervised physical therapy and two or more different non-steroidal anti-inflammatory drugs; normal or minimally abnormal radiographs; fulfilment of ACR criteria for classification of knee osteoarthritis.

Exclusion criteria included back, hip, ankle or foot disease of significant severity to potentially confuse assessment of knee pain; intra-articular corticosteroid injection into affected knee within 1 month; significantly abnormal radiographs; BMI > 35 kg/m^2.

Technique: Small-calibre knee arthroscopy using local anaesthesia.

Follow-up = 12 months

Conflict of interest: none stated</td>
<td>Need for further surgery
No data reported.

Mean reduction in aggregate WOMAC (composite marker of pain, stiffness and function), WOMAC subscores, and pain VAS from baseline to 12 months:

<table>
<tr><th></th><th>3 litre washout (CI)</th><th>0.25 litre washout (CI)</th></tr>
<tr><td>Aggregate WOMAC</td><td>8.9 (4.9 to 13.0)</td><td>15.5 (7.7 to 23.4)</td></tr>
<tr><td></td><td colspan="2">p = 0.10</td></tr>
<tr><td>WOMAC pain</td><td>2.3 (–0.1 to 4.7)</td><td>4.2 (–0.9 to 9.4)</td></tr>
<tr><td></td><td colspan="2">p = 0.04</td></tr>
<tr><td>WOMAC stiffness</td><td>0.7 (–0.5 to 1.9)</td><td>1.2 (–1.6 to 4.0)</td></tr>
<tr><td></td><td colspan="2">p = 0.22</td></tr>
<tr><td>WOMAC function</td><td>6.1 (2.8 to 9.4)</td><td>9.9 (4.9 to 13.0)</td></tr>
<tr><td></td><td colspan="2">p = 0.15</td></tr>
<tr><td>Patient pain (VAS)</td><td>0.12 (0 to 0.3)</td><td>1.47 (–1.2 to 4.1)</td></tr>
<tr><td></td><td colspan="2">p = 0.02</td></tr>
</table>
</td>
<td>No complications were described.</td>
<td>Patients were assigned to treatment groups by simple randomisation using a random-number generator.

Patients were given the option of conventional therapy including percutaneous washout as an alternative to participation in the study.

Patients and assessors were blinded to treatment group. The blinded assessors were rheumatologists who did not participate in the washout procedures.

WOMAC is a validated self-administered health status instrument for patients with osteoarthritis of the hip or knee.

The reported power calculation suggests that the planned sample size of 50 subjects in each group gives 80% power to detect a treatment effect explaining 30% of the residual variance after controlling for baseline score and any other significant covariates.

Patients in the 3 litre washout group had significantly more knee swelling at baseline than the controls, but there were no other significant differences between the groups in terms of symptom duration, tenderness, radiographic score, inflammation score, patient assessment and WOMAC score.</td>
</tr>
</table>

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

<table>
<tr><th>Study details</th><th>Key efficacy findings</th><th>Key safety findings</th><th>Comments</th></tr>
<tr>
<td>Chang RW (1993)[4]

Randomised controlled trial

USA

Study period: not stated

n = 32 patients

Population: Patients with non-end-stage osteoarthritis of the knee
• 56% (18/32) = arthroscopic surgery (mean age = 61 years, male = 28%)
• 44% (14/32) = closed-needle joint lavage (mean age = 65 years, male = 29%)
Indications: Inclusion criteria included persistent knee pain > 3 months, despite conservative medical and rehabilitation management, which restricted activities to an extent unacceptable to patient; grade 1, 2 or 3 radiographic changes; age > 20 years.
Exclusion criteria: Knee surgery within 6 months; total knee replacement; any concurrent illness that would influence functional assessment of the knee; Kellgren class 4 changes.

Technique: Arthroscopic surgery was performed under general anaesthesia and included debridement, removal of proliferative synovium and excision of loose articular cartilage fragments. All patients received continuous saline lavage during the procedure. Closed-needle lavage was done under local anaesthesia.
Chang RW (1993) continued

Follow-up = 12 months
Conflict of interest: none stated</td>
<td>Functional outcomes at 12 months follow-up
<table>
<tr><th></th><th>Arthroscopic surgery (n = 18)</th><th>Control (n = 14)</th></tr>
<tr><td>Active range of motion (degrees)*</td><td>116</td><td>115</td></tr>
<tr><td colspan="2">Difference = 1 (CI: –7 to 10)</td></tr>
<tr><td>% with knee tenderness improved</td><td>47</td><td>31</td></tr>
<tr><td colspan="2">Difference = 16 (CI: –18 to 50)</td></tr>
<tr><td>% with knee swelling improved</td><td>35</td><td>14</td></tr>
<tr><td colspan="2">Difference = 21 (CI: –10 to 52)</td></tr>
<tr><td>AIMS pain scale*</td><td>5.3</td><td>5.0</td></tr>
<tr><td colspan="2">Difference = 0.3 (CI: –1.1 to 1.8)</td></tr>
<tr><td>AIMS physical activity*</td><td>4.8</td><td>6.2</td></tr>
<tr><td colspan="2">Difference = –1.4 (CI: –3.3 to 0.4)</td></tr>
<tr><td>AIMS physical function*</td><td>1.7</td><td>2.0</td></tr>
<tr><td colspan="2">Difference = –0.3 (CI: –1.1 to 0.5)</td></tr>
<tr><td>AIMS social activity*</td><td>4.6</td><td>4.3</td></tr>
<tr><td colspan="2">Difference = 0.3 (CI: –1.1 to 1.5)</td></tr>
<tr><td>AIMS depression*</td><td>1.8</td><td>2.6</td></tr>
<tr><td colspan="2">Difference = –0.8 (CI: –1.6 to 0.1)</td></tr>
<tr><td>50-feet walk time (seconds)*</td><td>13.9</td><td>14.1</td></tr>
<tr><td colspan="2">Difference = –0.2 (CI: –2.8 to 2.3)</td></tr>
<tr><td>Overall well-being (10 cm VAS), range 0–10, best to worst</td><td>4.1</td><td>3.3</td></tr>
<tr><td colspan="2">Difference = 0.8 (CI: –5.3 to 21.2)</td></tr>
<tr><td>Physician, % improved</td><td>41</td><td>23</td></tr>
<tr><td colspan="2">Difference = 18 (CI: –15 to 51)</td></tr>
</table>
*values are adjusted means after controlling for baseline differences</td>
<td>No complications were described.</td>
<td>More than 200 patients were evaluated; 90 fulfilled the inclusion criteria after medical and rehabilitation management. About 45 of these had arthroscopic surgery outside the study.

Eligible patients were asked if they would accept an arthroscopic procedure if it was offered. Subjects who answered yes were then randomly assigned to arthroscopy or lavage.

34 patients were randomised into study but 2 dropped out before treatment because of medical problems.

Three patients who were randomised to receive arthroscopy did not have the surgery; the results did not differ when these patients were excluded or classified as arthroscopy or control patients.

The postoperative outcome assessor was blinded to treatment allocation.

16% (5/32) patients were lost to follow-up. Analyses were done twice: first using missing data substitutions and then excluding patients with missing data. No differences in summary measures or hypothesis tests were found.

Small sample size.</td>
</tr>
</table>

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

Study details	Key efficacy findings	Key safety findings	Comments
Chang RW (1993) *continued*	Active and passive range of knee motion was measured by goniometry. Knee joint swelling and tenderness were measured on a 4-point ordinal scale as defined by ACR glossary. Improvement in either swelling or tenderness was defined as a decrease of at least 1 point on the appropriate scale. AIMS scales are scored from 0 (best) to 10 (worst) according to the patient's responses to a self-administered questionnaire. Improvement in pain score was defined as a decrease of at least 1 point from the baseline score. Physician's global assessment of disease activity was made using a 4-point ordinal scale, ranging from no disease to very severe disease. Improvement from the physician's perspective was defined as a decrease of at least 1 point on the scale. 17% of patients had worsening of symptoms after arthroscopy.		

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

<table>
<tr><th>Study details</th><th>Key efficacy findings</th><th>Key safety findings</th><th>Comments</th></tr>
<tr>
<td>Forster MC et al (2003)[5]

Randomised controlled trial

UK

Study period: not stated

n = 38 patients

Population: Patients with symptomatic knee osteoarthritis without mechanical symptoms
• 50% (19/38) = hyaluronic acid injections (mean age = 60 years)
• 50% (19/38) = arthroscopic lavage (mean age = 63 years)

Indications: Inclusion criteria included symptomatic knee osteoarthritis with radiographic evidence of some remaining joint space on weight-bearing films. Exclusion criteria: Mechanical symptoms; intra-articular injection within last 6 months; previous arthroscopic surgery; hypersensitivity to avian proteins.
Technique: Arthroscopic lavage with at least 2 litres saline was performed under general or spinal anaesthesia (1 patient also had a partial medial meniscectomy and 1 had a chondral flap excised). Five intra-articular hyaluronic acid injections were administered at 1-week intervals.

Follow-up = 12 months

Conflict of interest: none stated</td>
<td>Further intervention necessary at 1 year:
• hyaluronic acid = 41% (7/17) (5 patients had or were waiting for total knee replacement)
• arthroscopic lavage = 20% (3/15) (all had or were waiting for total knee replacement)

Improvement at 1 year and no further intervention necessary:
• hyaluronic acid = 47% (8/17)
• Arthroscopic lavage = 53% (8/15)

VAS pain score (range 0–10)
<table><tr><th></th><th>Pre-trial</th><th>1 year</th></tr><tr><td>Hyaluronic acid</td><td>7.6</td><td>5.7</td></tr><tr><td>Arthroscopic lavage</td><td>7.5</td><td>5.7</td></tr></table>
Function score from Knee Society rating system
<table><tr><th></th><th>Pre-trial</th><th>1 year</th></tr><tr><td>Hyaluronic acid</td><td>65</td><td>90</td></tr><tr><td>Arthroscopic lavage</td><td>45</td><td>55</td></tr></table>Pre-trial function score was significantly worse in the arthroscopy group ($p < 0.05$)

There was no significant difference in pain score or function score between the two groups at 1 year.</td>
<td>No complications were described.</td>
<td>Randomisation was by sealed envelope.

Pre-trial function score was significantly worse in the arthroscopy group.

Four patients were lost to follow-up (two in each group).

Two patients randomised to arthroscopy declined surgery.

The number of patients assessed at 1 year is unclear. The paper states that some of the patients in both groups were excluded following further intervention (arthroscopy or total knee replacement). This introduces a selection bias, as patients with the worst outcome are removed, leaving the patients with a good outcome for analysis. If all patients with further intervention were removed from the analysis, the 1-year results are based on 10 patients in the hyaluronic acid group and 12 patients in the arthroscopy group.

Small sample size.</td>
</tr>
</table>

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

Study details	Key efficacy findings	Key safety findings	Comments
Livesley PJ et al (1991)[6] **Non-randomised controlled trial** UK Study period: not stated **n = 61 knees** Population: Patients with osteoarthritis of the knee • 61% (37/61) = arthroscopic lavage and physiotherapy (mean age = 61 years, male = 68%) • 39% (24/61) = physiotherapy alone (mean age = 61 years, male = 54%) Indications: Inclusion criteria included pain and no obvious mechanical derangement of the joint. Exclusion criteria: Haematological abnormalities, urate crystals in the joint aspirate or atypical radiographic signs. All knees with treatable lesions found at arthroscopy were excluded. Technique: Lavage with 2 litres saline; the same physiotherapy regimen was used in both groups. **Follow-up: 12 months** Conflict of interest: none stated	**Need for further surgery** No data reported. Pain and tenderness were recorded on a 0–4 scale, and effusions from 0 to 3. An improvement score was generated for each patient, being the difference between the scores at initial assessment and follow-up. The improvement scores of the two groups were then compared. *Results at 3-month follow-up (p values refer to differences between baseline and follow-up)* **Pain at rest (median pain scores)** • Lavage and physiotherapy = 0, p = 0.002 • Physiotherapy alone = 0.5, p = 0.008 **Pain on activity (median pain scores)** • Lavage and physiotherapy = 2, p = 0.00003 • Physiotherapy alone = 2, p = 0.05 Difference in improvement score between the groups, p = 0.003 **Pain at night (median pain scores)** • Lavage and physiotherapy = 1, p = 0.02 • Physiotherapy alone = 0.5, p = 0.06 **Joint tenderness (median score)** • Lavage and physiotherapy = 0, p = 0.0003 • Physiotherapy alone = 1, p = 0.002 **Peri-articular tenderness (median score)** • Lavage and physiotherapy = 0, p = 0.001 • Physiotherapy alone = 1, NS Difference in improvement score between the groups, p = 0.07 **Stress pain (median score)** • Lavage and physiotherapy = 0, p = 0.001 • Physiotherapy alone = 1, p = 0.001 **Swelling (median score)** • Lavage and physiotherapy = 0, p = 0.01 • Physiotherapy alone = 0, NS Difference in improvement score between the groups, p = 0.03 **Morning stiffness (duration in minutes)** • Lavage and physiotherapy = 5, p = 0.03 Physiotherapy alone = 10, NS	No safety data were reported.	Patients were divided into treatment groups according to whichever of two consultant surgeons they were initially referred to. Of 69 patients originally entered into trial, 6 were lost to follow-up (4 in physiotherapy arm and 2 in lavage group). Two patients underwent partial meniscectomies during arthroscopic lavage and were excluded from analysis. The paper presents follow-up data at 3, 6 and 12 months. The authors suggest that the improvement scores did not differ between the two groups in the longer term because the measure is too insensitive.

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

Study details	Key efficacy findings	Key safety findings	Comments
Livesley PJ et al (1991) *continued.*	*Results at 12-month follow-up (p values refer to differences between baseline and follow-up)* **Pain at rest (median pain scores)** • Lavage and physiotherapy = 0, p = 0.01 • Physiotherapy alone = 1.5, NS **Pain on activity (median pain scores)** • Lavage and physiotherapy = 2, p = 0.0005 • Physiotherapy alone = 2, NS **Pain at night (median pain scores)** • Lavage and physiotherapy = 1, p = 0.006 • Physiotherapy alone = 2, p = 0.1 **Joint tenderness (median score)** • Lavage and physiotherapy = 0, p = 0.06 • Physiotherapy alone = 1, NS **Swelling (median score)** • Lavage and physiotherapy = 1, NS • Physiotherapy alone = 1, NS **Morning stiffness (duration in minutes)** • Lavage and physiotherapy = 1, NS • Physiotherapy alone = 17.5, NS None of the differences in improvement scores between the two groups were significant at the 12-month follow-up. The improvement in the lavage group persisted for the duration of the trial. The physiotherapy group initially experienced an improvement but by the end of the study symptoms had returned to their pre-treatment state. Patients with slight radiographic changes experienced more pain relief than those with severe changes.		

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

Study details	Key efficacy findings	Key safety findings	Comments
Jackson RW & Dieterichs C (2003)[7] **Case series (retrospective)** USA Study period: 1995–1997 **n = 121 patients** Population: Patients with osteoarthritis of the knee previously untreated by any surgical procedure. • Stage 1 = 7% (8/121), mean age = 36 years • Stage II = 26% (32/121), mean age = 54 years • Stage III = 32% (39/121), mean age = 56 years • Stage IV = 35% (42/121), mean age = 64 years Indications: All patients were unresponsive to physiotherapy, analgesics, anti-inflammatory drugs and other conservative measures. Technique: Lavage, removal of loose bodies, trimming of meniscal fragments and conservative or minimal mechanical removal of cartilage fragments from femoral condyles **Follow-up = 4–6 years** Conflict of interest: none stated	**Repeat arthroscopy required** • Stage I = 0% (0/8) • Stage II = 9% (3/32) • Stage III = 15% (6/39) • Stage IV = 7% (3/42) **Replacement arthroplasty required** • Stage I = 0% (0/8) • Stage II = 0% (0/32) • Stage III = 8% (3/39) • Stage IV = 29% (12/42) *Stage I (n = 8)* All patients classified as having good-to-excellent results. *Stage II (n = 32)* 91% (29/32) patients classified as having good-to-excellent results. *Stage III (n = 39)* 77% (30/39) patients classified as having fair and good results. *Stage IV (n = 42)* 52% (22/42) patients subjectively evaluated their result as fair and 12% (5/42) assessed their result as good.	No complications were described.	Each case was prospectively assigned to one of four stages: • Stage I = minimal pain and swelling, slight radiographic changes • Stage II = pain with extra activity, joint-space narrowing • Stage III = swelling, loss of range of motion, pain with regular activities, joint-space narrowing, osteophyte formation and angulation • Stage IV = swelling, warmth, loss of range of motion, pain at rest, osteophytes, joint destruction.

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

Study details	Key efficacy findings	Key safety findings	Comments
Bernard J et al (2004)[8] **Case series (retrospective)** UK Study period: 1991–1993 **n = 100 knee arthroscopies** Population: 99 patients with osteoarthritis undergoing knee arthroscopy and washout Mean age = 55 years, male = 61% Indications: Pain uncontrolled by non-operative treatments in association with radiographic changes of osteoarthritis Technique: Debridement was performed as necessary, using only simple instruments such as punches, scissors and curettes. **Follow-up = 5 years** Conflict of interest: none stated	**Need for further surgery** 18% (18/100) knees required further surgery (4 osteotomy, 3 unicondylar arthroplasty, 11 total knee replacements). Patients having further surgery were significantly older than patients not requiring further surgery (mean age 62 vs 53 years, p = 0.008). Survival analysis revealed a biphasic failure pattern: an early rapid failure rate within the first 18 months (6.0% per year) followed by a slower but consistent rate of failure thereafter (2.8% per year). The rate of knee survival without operation at 5 years was significantly lower in patients over 60 years old than for younger patients (68% versus 89%, p = 0.02).	No complications were described.	Consecutive patients

Abbreviations used: ACR, American College of Rheumatology; AIMS, Arthritis Impact Measurement Scales; BMI, body mass index; CI, 95% confidence intervals; KSPS, Knee-specific Pain Scale; NS, not significant; VAS, visual analogue scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index

<table>
<tr><th>Study details</th><th>Key efficacy findings</th><th>Key safety findings</th><th>Comments</th></tr>
<tr>
<td>Harwin SF (1999)[9]

Case series (retrospective)

USA

Study period: 1980–1993

n = 204 knee arthroscopies

Population: 190 patients with osteoarthritis undergoing arthroscopic debridement and available for follow-up physical and radiographic examination
• Group I (normal mechanical axis) = 28% (57/204)
• Group II (up to 5° of varus or valgus) = 50% (102/204)
• Group III (over 5° of varus or valgus) = 22% (45/204)

Mean age = 62 years, male = 43%

Indications: Patients unresponsive to non-operative treatment, including lifestyle alterations, non-steroidal anti-inflammatory medication, physical therapy, and, occasionally, intra-articular steroid injection.
Technique: All debridements included lavage with varying amounts of saline. Care was taken to preserve as much meniscal tissue as possible. Most procedures were performed under general anaesthesia.

Mean follow-up = 7.4 years (range 2–15)

Conflict of interest: none stated</td>
<td>Need for further surgery
• Group I = 17.5% (10/57), including 2 osteotomies
• Group II = 14.7% (15/102), including 2 osteotomies and 3 joint arthroplasties
• Group III = 48.9% (22/45), all were joint arthroplasties
Mean time to further surgery
• Repeat arthroscopy = 3.2 years (range 6 months to 12 years)
• Osteotomy = 3.5 years (range 2–6 years)
• Total arthroplasty = 4.2 years (range 6 months to 10 years)

Predictors for better outcome were a younger age (p = 0.055), more normal mechanical axis (p < 0.0001, p < 0.001) and fewer prior surgeries (p = 0.019, p = 0.007)

Mean extension (degrees)
• Preoperative = –5 (range 0 to –15)
• Postoperative = –4 (range 0 to –15)
Mean flexion (degrees)
• Preoperative = 110 (range 85–130)
• Postoperative = 112 (range 88–130)
Mean HSS knee score (higher scores indicate improvement)
• Preoperative = 66 (range 58–72)
• Postoperative = 73 (range 58–85)
Clinical outcome by group (patient assessed) at follow-up
<table>
<tr><th>Group</th><th>Better</th><th>No change</th><th>Worse</th></tr>
<tr><td>I (n = 57)</td><td>48 (84.2%)</td><td>7 (12.3%)</td><td>2 (3.5%)</td></tr>
<tr><td>II (n = 102)</td><td>69 (67.6%)</td><td>24 (23.5%)</td><td>9 (8.8%)</td></tr>
<tr><td>III (n = 45)</td><td>12 (26.7%)</td><td>12 (26.7%)</td><td>21 (46.7%)</td></tr>
<tr><td>Total (n = 204</td><td>129 (63.2%)</td><td>43 (21.1%)</td><td>32 (15.7%)</td></tr>
</table>
</td>
<td>Complications
• Haemarthrosis requiring aspiration in 2% (4/204)
• Deep venous thrombosis in 0.5% (1/204)

There were no postoperative infections.</td>
<td>Patients were assigned to three groups based on alignment on standing anteroposterior radiographs.

During the study period, the surgeon performed 2730 knee arthroscopies. Of these, 248 knees (9%) had areas of fibrillated articular cartilage with exposed bone, which were the cases included for review. Of this group, 44 knees in 30 patients were lost to follow-up and were not included in the analysis.

There is no description of the HSS knee score in the paper.

All procedures included lavage as well as debridement; there were no lavage-only procedures.

The study findings suggest that degree of malalignment is an important predictor of efficacy outcomes.</td>
</tr>
</table>

Validity and generalisability of the studies

- Only three studies, none of them an RCT, reported data on the need for subsequent knee-replacement surgery.
- Two RCTs blinded both the patients and the assessors to the treatment allocation.[1,3]
- Two RCTs had very small sample sizes and may have been underpowered to detect differences in outcomes between treatments.[4,5]
- The three case series used debridement as well as lavage to treat some or all of the patients.[7,8,9] The extent of debridement varied between studies.
- Inclusion criteria varied between studies. Two studies included only patients with a normal or minimally abnormal radiograph[2,3] and one study excluded patients with mechanical symptoms.[5]
- In one RCT, a large proportion (44%) of people eligible for the study declined to participate, which may have introduced selection bias.[1] Patients in the study were significantly younger, more likely to be white and had more severe arthritis than the patients who declined to participate. Most patients in the study (97%) were men so it is difficult to know whether the results can be generalised to the whole population.

Specialist advisers' opinions

Specialist advice was sought from consultants who have been nominated or ratified by their Specialist Society or Royal College.

Mr C Ackroyd, Mr R Allum, Mr T Briggs, Professor PJ Gregg, Mr P Hirst, Mr S White

- The procedure is established practice.
- There is uncertainty regarding the efficacy of the procedure.
- Two advisers stated that there is no place for arthroscopic washout alone.
- Careful patient selection is important.

Issues for consideration by IPAC

- A NICE clinical guideline on osteoarthritis is in progress, which is due for publication in December 2007.
- The NHS Health Technology Assessment programme plans to set up a placebo-controlled trial of arthroscopic lavage in the UK and has commissioned the KORAL (Knee Osteoarthritis: Role of Arthroscopic Lavage) Study Group to assess the feasibility of such a trial. The pilot study commenced July 2005; expected publication date of the full trial is mid-2011.

References

1. Moseley JB, O'Malley K, Petersen NJ et al. (2002) A controlled trial of arthroscopic surgery for osteoarthritis of the knee. *The New England Journal of Medicine* 347: 81–8.
2. Hubbard MJS. (1996) Articular debridement versus washout for degeneration of the medial femoral condyle. *Journal of Bone and Joint Surgery (British)* 78-B: 217–19.
3. Kalunian KC, Moreland LW, Klashman DJ et al. (2000) Visually-guided irrigation in patients with early knee osteoarthritis: a multicenter randomized controlled trial. *Osteoarthritis and Cartilage* 8: 412–18.
4. Chang RW, Falconer J, Stulberg SD et al. (1993) A randomized, controlled trial of arthroscopic surgery versus closed-needle joint lavage for patients with osteoarthritis of the knee. *Arthritis & Rheumatism* 36: 289–96.
5. Forster MC, Straw R. (2003) A prospective randomised trial comparing intra-articular Hyalgan injection and arthroscopic washout for knee osteoarthritis. *The Knee* 10: 291–3.
6. Livesley PJ, Doherty M, Needoff M et al (1991) Arthroscopic lavage of osteoarthritic knees. *Journal of Bone and Joint Surgery (British)* 73-B: 922–6.
7. Jackson RW, Dieterichs C. (2003) The results of arthroscopic lavage and debridement of osteoarthritic knees based on the severity of degeneration: a 4- to 6-year symptomatic follow-up. *Arthroscopy: The Journal of Arthroscopic and Related Surgery* 19: 13–20.
8. Bernard J, Lemon M, Patterson MH. (2004) Arthroscopic washout of the knee – a 5-year survival analysis. *The Knee* 11: 233–5.
9. Harwin SF. (1999) Arthroscopic debridement for osteoarthritis of the knee: predictors of patient satisfaction. *Arthroscopy: The Journal of Arthroscopic and Related Surgery* 15: 142–6.
10. Allgood P. (2003) Arthroscopic lavage for knee osteoarthritis. *STEER* 3 (3): 1–10.
11. Bazian Ltd. (2005) Arthroscopic lavage for osteoarthritis of the knee. *Evidence-Based Healthcare & Public Health* 9: 192–6.

Appendix A: Additional papers on arthroscopic knee washout not included in summary Table 2

The following table outlines the studies that are considered potentially relevant to the overview but were not included in the main data extraction table (Table 2). It is by no means an exhaustive list of potentially relevant studies.

Article title	Number of patients/ follow-up	Direction of conclusions	Reasons for non-inclusion in Table 2
Chang RW, Falconer J, Stulberg SD, et al. (1993) A randomized, controlled trial of arthroscopic surgery versus closed-needle joint lavage for patients with osteoarthritis of the knee. *Arthritis and Rheumatism* 36: 289–96.	32 patients. (18 arthroscopic surgery, 14 closed-needle joint lavage)	44% patients in arthroscopy group and 58% patients in lavage group reported improvement at 1 year.	Small sample sizes (included in systematic review)
Edelson R, Burks RT, Bloebaum RD. (1995) Short-term effects of knee washout for osteoarthritis. *American Journal of Sports Medicine* 23: 345–9.	29 knees	86% (25/29) good or excellent at 1 year, 81% (17/21) at 2 years.	Small case series
Gibson JNA, White MD, Chapman VM et al. (1992) Arthroscopic lavage and debridement for osteoarthritis of the knee. *Journal of Bone and Joint Surgery (British)* 74-B: 534–7.	20 patients. 12-week follow-up	Neither debridement nor arthroscopic lavage significantly relieved symptoms.	Short term follow-up and small sample sizes
Hempfling H. (2007) Intra-articular hyaluronic acid after knee arthroscopy: a two-year study. *Knee Surgery, Sports Traumatology, Arthroscopy* 15 (5): 537-546.	RCT (arthroscopic knee joint lavage with debridement when indicated versus lavage followed by instillation of synovial fluid substitute) 80 patients. Follow-up = 2 years.	Both groups of patients showed comparable improvements immediately after the procedure. At 1 year, results were superior for group with instillation of synovial fluid substitute. The improvement persisted over 2-year follow-up	The main focus of the study was to assess the effects of instillation of synovial fluid substitute containing hyaluronic acid.

Article title	Number of patients/ follow-up	Direction of conclusions	Reasons for non-inclusion in Table 2
McLaren AC, Blokker CP, Fowler PJ et al. (1991) Arthroscopic debridement of the knee for osteoarthritis. *Canadian Journal of Surgery* 34: 595–8.	171 patients Mean follow-up = 25 months	Lavage and debridement Excellent control of pain in 38% of patients and improved function in 22%. Subsequent surgical procedures were required in 12%.	Shorter follow-up than case series included in table 2.
Shannon FJ, Devitt AT, Poynton AR et al. (2001) Short-term benefit of arthroscopic washout in degenerative arthritis of the knee. *International Orthopaedics* 25: 242–5.	55 knees. Mean follow-up = 29.6 months.	68% (37/54) patients reported subjective improvement in symptoms. Mean duration of benefit was 25.5 months.	Small case series.
Siparsky P et al. (2007) Arthroscopic treatment of osteoarthritis of the knee. *Clinical Orthopaedics and Related Research* 455: 107–12.	Systematic review (no meta-analysis)	18 relevant studies were identified (one described as Level I evidence, 5 were level II, 6 were level III, 6 were level IV). Report concluded that there was limited evidence-based research to support the use of arthroscopy as a treatment method for osteoarthritis of the knee.	No meta-analysis. The article reviewed all types of arthroscopic treatment.
Spahn G, Muckley T, Kahl E, et al (2006) Factors affecting the outcome of arthroscopy in medial-compartment osteoarthritis of the knee. *Arthroscopy* 22 (11): 1233–40.	n = 156 Mean follow-up = 49 months	7% of patients were lost to follow-up. 'Poor' outcome = 72% (104/145)	All procedures included lavage together with debridement or microfracturing.
Ward PJ, Ramos JL, Fernandez GN et al. (1998) A prospective randomised controlled trial of cannula versus arthroscopic lavage in patients with osteoarthritis of the knee. *Journal of Bone and Joint Surgery (British)* 80-B Supp I: 46.	51 patients	No significant difference in outcome between the two groups. Cannula lavage is an effective and viable alternative to arthroscopic lavage of the knee.	Conference abstract only (included in systematic review)

Appendix B: Related published NICE guidance for arthroscopic knee washout

Guidance programme	Recommendation
Interventional procedures	**Mini-incision surgery for total knee replacement** 1.1 Current evidence on the safety and efficacy of mini-incision surgery for total knee replacement does not appear adequate for this procedure to be used without special arrangements for consent and for audit or research. More evidence is required on the long-term safety and efficacy of this procedure and clinicians should submit data to the National Joint Registry (www.njrcentre.org.uk). 1.2 Clinicians wishing to undertake mini-incision surgery for total knee replacement should take the following action. • Inform the clinical governance leads in their Trusts. • Ensure that patients understand the uncertainty about the procedure's safety and efficacy and provide them with clear written information. Use of the Institute's *Information for the Public* is recommended. 1.3 Clinicians undertaking this procedure should have adequate training before performing this technique. 1.4 Further research will be useful. Clinicians are encouraged to enter patients in well-defined trials and to collect longer-term follow-up data. The Institute may review the procedure upon publication of further evidence.
Technology appraisals	None applicable
Clinical guidelines	**Osteoarthritis: the care and management of adults with osteoarthritis.** *NICE clinical guideline*. (Publication expected December 2007.) **Rheumatoid arthritis in adults.** *NICE clinical guideline.* (Publication expected December 2008.)
Public health	None applicable

Appendix C: Literature search for arthroscopic knee washout

IP: 366 Arthroscopic Knee Washout.		
Database	**Date searched**	**Version searched**
Cochrane Library	19/06/2006	Issue 2, 2006
CRD databases	19/06/2006	Issue 2, 2006
Embase	16/06/2006	1980 to 2006 Week 23
Medline	16/06/2006	1966 to June Week 1 2006
PreMedline	16/06/2006	June 15, 2006
CINAHL	19/06/2006	1982 to June Week 2 2006
British Library Inside Conferences	19/06/2006	-
NRR	19/06/2006	2006 Issue 2
Controlled Trials Registry	19/06/2006	1982 to June Week 2 2006

The following search strategy was used to identify papers in Medline. A similar strategy was used to identify papers in other databases.

1 Arthroscopy/
2 Arthroscop$.tw.
3 or/1-2
4 Irrigation/
5 (irrigat$ or wash$ or douch$ or lavage$).tw.
6 Debridement/
7 Debride$.tw.
8 or/4-7
9 exp Arthritis/
10 arthrit$.tw.
11 exp Osteoarthritis/
12 osteoarthrit$.tw.
13 or/9-12
14 Knee Joint/
15 Knee/
16 knee.tw.
17 or/14-16
18 3 and 8 and 13 and 17
19 Animals/
20 Humans/
21 19 not (19 and 20)
22 18 not 21
23 from 22 keep 1-214