

**HEALTH EVIDENCE REVIEW COMMISSION (HERC)**  
**COVERAGE GUIDANCE: HIP SURGERY PROCEDURES FOR**  
**FEMOROACETABULAR IMPINGEMENT SYNDROME**

**As posted for public comment 6/27/2013**

HERC COVERAGE GUIDANCE

Surgery for femoroacetabular impingement syndrome is not recommended for coverage (*strong recommendation*).

Note: Definitions for strength of recommendation are provided in Appendix A GRADE Element Description

RATIONALE FOR GUIDANCE DEVELOPMENT

The HERC selects topics for guideline development or technology assessment based on the following principles:

- Represents a significant burden of disease
- Represents important uncertainty with regard to efficacy or harms
- Represents important variation or controversy in clinical care
- Represents high costs, significant economic impact
- Topic is of high public interest

Coverage guidance development follows to translate the evidence review to a policy decision. Coverage guidance may be based on an evidence-based guideline developed by the Evidence-based Guideline Subcommittee or a health technology assessment developed by the Health Technology Assessment Subcommittee. In addition, coverage guidance may utilize an existing evidence report produced by one of HERC's trusted sources, generally within the last three years.

EVIDENCE SOURCES

Washington State Health Care Authority Health Technology Assessment Program. (2011). *Hip surgery procedures for treatment of femoroacetabular impingement syndrome: Health technology assessment*. Retrieved from <http://www.hta.hca.wa.gov/fai.html>

National Institute for Health and Clinical Excellence. (2011a). *Interventional Procedure Guidance 403: Open femoro-acetabular surgery for hip impingement syndrome*. London: National Institute for Health and Clinical Excellence. Retrieved from <http://guidance.nice.org.uk/IPG403>

National Institute for Health and Clinical Excellence. (2011b). *Interventional Procedure Guidance 408: Arthroscopic femoro-acetabular surgery for hip impingement syndrome*. London: National Institute for Health and Clinical Excellence. Retrieved from <http://guidance.nice.org.uk/IPG408>

National Institute for Health and Clinical Excellence. (2011c). *Interventional procedure overview of open femoro-acetabular surgery for hip impingement syndrome*. London: National Institute for Health and Clinical Excellence. Retrieved from <http://guidance.nice.org.uk/IPG403>

National Institute for Health and Clinical Excellence. (2011d). *Interventional procedure overview of arthroscopic femoro-acetabular surgery for hip impingement syndrome*. London: National Institute for Health and Clinical Excellence. Retrieved from <http://guidance.nice.org.uk/IPG408>

The summary of evidence in this document is derived directly from this evidence sources, and portions are extracted verbatim.

## SUMMARY OF EVIDENCE

### **Clinical Background**

Femoroacetabular impingement (FAI) syndrome is a recently recognized diagnosis in primarily younger individuals where relatively minor abnormalities in the joint (orientation or morphology) are thought to cause friction/impingement and pain. It is theorized that FAI starts the breakdown of cartilage, leading to osteoarthritis. There are two types of FAI: cam impingement (non-spherical femoral head or abnormality at the head-neck junction) and pincer impingement (deep or retroverted acetabulum resulting in overcoverage of the femoral head). Proponents believe that surgical correction of the impinging deformities will alleviate the symptoms and retard the progression of osteoarthritis degeneration. Surgery to correct FAI includes arthroscopy, open dislocation of the hip and arthroscopy combined with a mini-open approach. The purpose of the surgery is to remove abnormal outgrowths of bone and damaged cartilage, and to reshape the femoral neck to ensure that there is sufficient clearance between the rim of the acetabulum and the neck of the femur. The causes of hip pain, the natural history of FAI and its relationship to osteoarthritis are unclear, and the case definition and selection criterion of patients for this procedure is uncertain. Furthermore, questions remain about the efficacy and effectiveness, safety and cost effectiveness of hip surgery for FAI.

## Evidence Review

The evidence review addressed questions concerning case definition, evaluation of treatment outcomes, effectiveness and safety of hip surgery for FAI. To address the question of case definition, the most consistent case definition of FAI (cam or mixed) includes hip/groin pain, positive clinical impingement test, and an  $\alpha$ -angle  $>50$ - $55^\circ$ . There is no evidence that the diagnosis of FAI can be obtained from clinical exam. One clinical test, the impingement sign, had a positive and negative predictive value of 86% and 79% in one study where the prevalence of FAI was 50%; however, in another study, the interobserver reliability of the impingement sign was only moderate. Even though the  $\alpha$ -angle showed moderate to high interobserver reliability in several studies, it had poor diagnostic value in identifying FAI. Other imaging tests assessing abnormalities of the femur and acetabulum had variable degrees of reliability, but no others were tested for diagnostic validity.

Regarding outcome measures to evaluate the effectiveness of hip surgery for FAI, seven hip outcome measures were commonly used in the FAI patient population, but only three have undergone psychometric analysis in FAI (Hip Outcome Score, German version [HOS-D] and the modified Western Ontario and McMaster Universities Arthritis Index [M-WOMAC] or young hip-pain patients Nonarthritic Hip Score [NAHS]). Reliability was inadequately tested for all three instruments. The minimal clinically important difference was defined in only one measure, the HOS-D, and found to be 9 points for the activities of daily living subscale and 6 points for the sports subscale in FAI patients.

Regarding the efficacy of hip surgery for FAI, there are no randomized controlled trials (RCTs) available to assess the short- or long-term efficacy of FAI surgery compared with no surgery. Comparative evidence for this condition is limited to one retrospective cohort study comparing FAI surgery to conservative treatment, and four retrospective studies comparing various surgical treatments.

The only study to compare FAI surgery to no surgery included 17 patients (22 hips) who underwent three different treatments: nonoperative care with physiotherapy and anti-inflammatory medications, arthroscopy or open dislocation, and total hip replacement (THA). There were nine patients (10 hips) in the nonoperative group, six patients (eight hips) in the FAI surgery group, and two patients (four hips) in the THA group. The authors gave no indication of how these patients were selected or how many patients overall may have been eligible for the study; they simply stated that radiographic findings of osseous bump deformities on the anterolateral head-neck junction were found in all patients along with typical symptoms of FAI. They did, however, admit that the treatment received was based according to clinical and radiographic findings and MRI, thus acknowledging the potential of confounding by indication. Those with

moderate clinical symptoms but morphological signs of degenerative destruction of the hip joints underwent nonoperative treatment. Those with labral defects but only minor cartilage destruction on MRI underwent FAI surgery. The two patients who received THA did so as a result of having severe signs of osteoarthritis on radiographs. The authors provide no information regarding the patient selection process or loss to follow-up. There was no description of baseline characteristics apart from the mean age of patients. With respect to age, there were potentially important differences in ages of the patients among the three treatment groups. Only pain and return to work/sports are reported at final follow-up, with patients in the conservative group showing the poorest results overall: none were pain free at final follow-up compared with 100% of the patients in both surgical groups. Only 67% had returned to their previous work or sports level again compared with 100% of the patients in both surgical groups. It is difficult to draw any conclusions from this study as the patient groups compared were clearly different in many characteristics.

Of the other four cohort studies, two compared labral debridement with labral fixation, and two compared arthroscopic debridement and osteoplasty with arthroscopic debridement alone. Overall, none of these studies demonstrate that one specific treatment results in better outcomes than another (surgery versus no surgery, labral debridement versus refixation, osteoplasty versus no osteoplasty). Several case series report improvement in pain, patient reported and clinician reported hip outcome scores, patient satisfaction and return to normal activities following FAI surgery. However, whether this improvement is a result of the surgery, or the postoperative rehabilitation, or the change in activity subsequent to the surgery or placebo is not known. Approximately 8% of patients diagnosed with FAI who undergo surgery in published series go on to have a total hip arthroplasty within 3 years. There are no data available to assess long-term effectiveness of FAI surgery compared with no surgery. There are no data yet published to test the hypothesis that FAI surgery prevents or delays hip osteoarthritis or the need for total hip arthroplasty.

Regarding the safety of hip surgery for FAI, the risk of reoperation (other than conversion to THA) occurred in 4% (arthroscopy and open dislocation) and 9% of the patients (mini-open). There was only one reported head-neck fracture (0.1%) and no reports of AVN, osteonecrosis or trochanteric nonunion. Heterotopic ossification occurred in 2% to 3% of those receiving arthroscopy or mini-open, and 6% in those receiving open dislocation. Neurological complications (nerve palsy, paresthesia, and neuropraxia) were rare in those receiving arthroscopy or open dislocation; however, they occurred in 22% of 258 hips undergoing a mini-open procedure. Most were transient in nature.

## [\[Evidence Source\]](#)

The National Institute for Clinical Excellence issued interventional procedure guidances on arthroscopic and open surgery for FAI in September and July 2011, respectively. Both guidances state that current evidence on the efficacy of arthroscopic or open femoro–acetabular surgery for hip impingement syndrome is adequate in terms of symptom relief in the short and medium term. With regard to safety, there are well recognized complications. Therefore this procedure may be used provided that normal arrangements are in place for clinical governance, consent and audit with local review of outcomes. They have established a registry to track long term outcomes of these procedures.

The literature review conducted to inform the NICE guidance consisted of one non-randomized controlled study and seven case series for the open procedure, and three non-randomized controlled studies, five case series and one case report for the arthroscopic procedure. The reviews report the following regarding the evidence base:

- Little or no controlled data are available comparing the procedure with other interventions or against natural history.
- A range of outcome assessment scales are used; validation of these scales is often not reported.
- The description of hip impingement pathology/lesions is not well defined in all studies.
- The intervention required is usually individualized to each patient, making comparison between studies difficult.

Study quality is generally poor, with little prospective data collection in case series.

[\[NICE IPG 403\]](#), [\[NICE IPG408\]](#)

### **Evidence Summary**

The most consistent case definition of FAI (cam or mixed) includes hip/groin pain, positive clinical impingement test, and an  $\alpha$ -angle  $>50$ - $55^\circ$ ; the predictive value of the impingement test ranges from 79 to 86%, while the  $\alpha$ -angle has poor diagnostic value. Seven hip outcome measures are commonly used in the FAI patient population, but only three have undergone psychometric analysis in FAI, and reliability has been inadequately tested for all three. There are no data available to assess the short- or long-term efficacy of FAI surgery compared with no surgery, and no evidence that one specific treatment results in better outcomes than another. Regarding safety, the risk of reoperation (other than conversion to THA) is 4% to 9%, and heterotopic ossification occurs in 2% to 6% of patients, while neurological complications occur in up to 22% of patients.

After reviewing the available evidence including the lack of RCTs comparing FAI surgery to conservative care, as well as non-RCT comparative data demonstrating non-superiority of surgery, the WA HTA Clinical Committee concluded that the evidence was insufficient to recommend coverage of the procedure. The National Institute for Clinical Excellence has issued a guidance allowing for use of both arthroscopic and open procedures, despite a poor quality evidence base. They have established a registry to track long term outcomes.

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## GRADE-INFORMED FRAMEWORK

The HERC develops recommendations by using the concepts of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. GRADE is a transparent and structured process for developing and presenting evidence and for carrying out the steps involved in developing recommendations. There are four elements that determine the strength of a recommendation, as listed in the table below. The HERC reviews the evidence and makes an assessment of each element, which in turn is used to develop the recommendations presented in the coverage guidance box. Balance between desirable and undesirable effects, and quality of evidence, are derived from the evidence presented in this document, while estimated relative costs, values and preferences are assessments of the HERC members.

Indication	Balance between desirable and undesirable effects	Quality of evidence*	Resource Allocation	Values and preferences	Expert Input	Coverage Recommendation
Surgery for FAI	Unknown	Very low	Unknown at this time. Surgical intervention is generally more costly than conservative care in the short term.	High variability. Younger patients would generally want to avoid total hip replacement if there are effective alternatives.		Surgery for femoroacetabular impingement syndrome is not recommended for coverage ( <i>strong recommendation</i> )

\*The Quality of Evidence rating was assigned by the primary evidence source, not the HERC Subcommittee

Note: GRADE framework elements are described in Appendix A

## POLICY LANDSCAPE

No quality measures were identified when searching the [National Quality Measures Clearinghouse](#).

## COMMITTEE DELIBERATIONS – HTAS

## COMMITTEE DELIBERATIONS – VBBS

Coverage guidance is prepared by the Health Evidence Review Commission (HERC), HERC staff, and subcommittee members. The evidence summary is prepared by the Center for Evidence-based Policy at Oregon Health & Science University (the Center). This document is intended to guide public and private purchasers in Oregon in making informed decisions about health care services.

The Center is not engaged in rendering any clinical, legal, business or other professional advice. The statements in this document do not represent official policy positions of the Center. Researchers involved in preparing this document have no affiliations or financial involvement that conflict with material presented in this document.

## Appendix A. GRADE Element Descriptions

Element	Description
Balance between desirable and undesirable effects	The larger the difference between the desirable and undesirable effects, the higher the likelihood that a strong recommendation is warranted. The narrower the gradient, the higher the likelihood that a weak recommendation is warranted
Quality of evidence	The higher the quality of evidence, the higher the likelihood that a strong recommendation is warranted
Resource allocation	The higher the costs of an intervention—that is, the greater the resources consumed—the lower the likelihood that a strong recommendation is warranted
Values and preferences	The more values and preferences vary, or the greater the uncertainty in values and preferences, the higher the likelihood that a weak recommendation is warranted

### Strong recommendation

***In Favor:*** The subcommittee is confident that the desirable effects of adherence to a recommendation outweigh the undesirable effects, considering the quality of evidence, cost and resource allocation, and values and preferences.

***Against:*** The subcommittee is confident that the undesirable effects of adherence to a recommendation outweigh the desirable effects, considering the quality of evidence, cost and resource allocation, and values and preferences.

### Weak recommendation

***In Favor:*** the subcommittee concludes that the desirable effects of adherence to a recommendation probably outweigh the undesirable effects, considering the quality of evidence, cost and resource allocation, and values and preferences, but is not confident.

***Against:*** the subcommittee concludes that the undesirable effects of adherence to a recommendation probably outweigh the desirable effects, considering the quality of evidence, cost and resource allocation, and values and preferences, but is not confident.

### Quality of evidence across studies for the treatment/outcome

***High*** = Further research is very unlikely to change our confidence in the estimate of effect.

***Moderate*** = Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

***Low*** = Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

***Very low*** = Any estimate of effect is very uncertain.

## Appendix B. Applicable Codes

<b>CODES</b>	<b>DESCRIPTION</b>
<b>ICD-9 Diagnosis Codes</b>	
715-715.9	Osteoarthritis
718.05	Articular cartilage disorder, pelvic region
718.45	Contracture of joint, pelvic region and thigh
718.65	Unspecified intrapelvic protrusion acetabulum, pelvic region and thigh
718.85	Other joint derangement, not elsewhere classified
718.95	Unspecified derangement of joint
719.45	Pain in joint, pelvic region and thigh
719.55	Stiffness of joint, not elsewhere classified, pelvic region and thigh
719.7	Difficulty in walking
719.85	Other specified disorders of joint, pelvic region and thigh
719.95	Unspecified disorder of joint, pelvic region and thigh
736.30	Acquired deformities of hip, unspecified deformity
736.39	Acquired deformities of hip, other
<b>ICD-9 Volume 3 (Procedure Codes)</b>	
80.15	Other Arthrotomy, Hip
80.25	Arthroscopy, Hip
80.45	Division Of Joint Capsule, Ligament, Or Cartilage; Hip
81.40	Repair Of Hip, Not Elsewhere Classified
<b>CPT Codes</b>	
29914	Arthroscopy, hip, surgical; with femoroplasty (i.e., treatment of cam lesion)
29915	Arthroscopy, hip, surgical; with acetabuloplasty (i.e., treatment of pincer lesion)
29916	Arthroscopy, hip, surgical; with labral repair
<b>HCPCS Level II Codes</b>	
None	

Note: Inclusion on this list does not guarantee coverage

# Appendix C. HERC Guidance Development Framework

## Surgery for FAI Syndrome



### HERC Guidance Development Framework

Refer to HERC Guidance Development Framework Principles for additional considerations

- Decision Point Priorities**
1. Level of evidence
  2. Effectiveness & alternative treatments
  3. Harms and risk
  4. Cost
  5. Prevalence of treatment
  6. Clinical research study is reasonable

FINAL 1/10/2013

