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<b>Medical Benefit</b>		<b>Effective Date:</b> 10/01/13	<b>Next Review Date:</b> 07/23
<b>Preauthorization</b>	No	<b>Review Dates:</b> 09/09, 09/10, 07/11, 07/12, 07/13, 07/14, 07/15, 07/16, 07/17, 07/18, 07/19, 07/20, 07/21, 07/22	

**Preauthorization is not required.**

*The following protocol contains medical necessity criteria that apply for this service. The criteria are also applicable to services provided in the local Medicare Advantage operating area for those members, unless separate Medicare Advantage criteria are indicated. If the criteria are not met, reimbursement will be denied and the patient cannot be billed. Please note that payment for covered services is subject to eligibility and the limitations noted in the patient's contract at the time the services are rendered.*

**RELATED PROTOCOL**

Hip Resurfacing

Populations	Interventions	Comparators	Outcomes
Individuals: <ul style="list-style-type: none"> <li>Who are adults with asymptomatic femoroacetabular impingement</li> </ul>	Interventions of interest are: <ul style="list-style-type: none"> <li>Femoroacetabular impingement surgery</li> </ul>	Comparators of interest are: <ul style="list-style-type: none"> <li>Observation</li> </ul>	Relevant outcomes include: <ul style="list-style-type: none"> <li>Symptoms</li> <li>Functional outcomes</li> <li>Health status measures</li> <li>Quality of life</li> <li>Change in disease status</li> </ul>
Individuals: <ul style="list-style-type: none"> <li>Who are adults with symptomatic femoroacetabular impingement</li> </ul>	Interventions of interest are: <ul style="list-style-type: none"> <li>Femoroacetabular impingement surgery</li> </ul>	Comparators of interest are: <ul style="list-style-type: none"> <li>Conservative management</li> </ul>	Relevant outcomes include: <ul style="list-style-type: none"> <li>Symptoms</li> <li>Functional outcomes</li> <li>Health status measures</li> <li>Quality of life</li> <li>Change in disease status</li> </ul>
Individuals: <ul style="list-style-type: none"> <li>Who are children ≤15 years of age with symptomatic femoroacetabular impingement</li> </ul>	Interventions of interest are: <ul style="list-style-type: none"> <li>Femoroacetabular impingement surgery</li> </ul>	Comparators of interest are: <ul style="list-style-type: none"> <li>Conservative management</li> </ul>	Relevant outcomes include: <ul style="list-style-type: none"> <li>Symptoms</li> <li>Functional outcomes</li> <li>Health status measures</li> <li>Quality of life</li> <li>Change in disease status</li> </ul>
Individuals: <ul style="list-style-type: none"> <li>Who are children ≤15 years of age with slipped capital femoral epiphysis-associated femoroacetabular impingement</li> </ul>	Interventions of interest are: <ul style="list-style-type: none"> <li>Femoroacetabular impingement surgery</li> </ul>	Comparators of interest are: <ul style="list-style-type: none"> <li>Surgical repair of slipped capital femoral epiphysis alone</li> </ul>	Relevant outcomes include: <ul style="list-style-type: none"> <li>Symptoms</li> <li>Functional outcomes</li> <li>Health status measures</li> <li>Quality of life</li> <li>Change in disease status</li> </ul>

Populations	Interventions	Comparators	Outcomes
Individuals: <ul style="list-style-type: none"> <li>• With residual femoroacetabular impingement symptoms following primary surgery</li> </ul>	Interventions of interest are: <ul style="list-style-type: none"> <li>• Revision arthroscopic surgery</li> </ul>	Comparators of interest are: <ul style="list-style-type: none"> <li>• Conservative management</li> </ul>	Relevant outcomes include: <ul style="list-style-type: none"> <li>• Symptoms</li> <li>• Functional outcomes</li> <li>• Health status measures</li> <li>• Quality of life</li> <li>• Change in disease status</li> </ul>

## DESCRIPTION

Femoroacetabular impingement results from localized compression within the joint as a result of an anatomic mismatch between the head of the femur and the acetabulum. Symptoms of impingement typically occur in young to middle-aged adults before the onset of osteoarthritis but may be present in younger patients with developmental hip disorders. The objective of surgical treatment of femoroacetabular impingement is to provide symptom relief and reduce further joint damage.

## SUMMARY OF EVIDENCE

For individuals who are adults with asymptomatic femoroacetabular impingement who receive femoroacetabular impingement surgery, there is no direct evidence that the surgical treatment will prevent the development of osteoarthritis. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and change in disease status. Indirect evidence consists of observational studies. In retrospective studies of patients with osteoarthritis, the relevant outcomes were radiographic evidence of hip joint malformations. In prospective studies of patients with femoroacetabular impingement, the relevant outcome is progression to osteoarthritis. Several large observational studies (>1000 patients), as well as smaller studies, have shown radiographic evidence of relationships between abnormal hip morphology and the development of osteoarthritis. There have been no studies in which femoroacetabular impingement surgery was performed on patients with femoroacetabular impingement morphology but no symptoms. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who are adults with symptomatic femoroacetabular impingement who receive femoroacetabular impingement surgery, the evidence includes systematic reviews of large and small observational studies and a small randomized controlled trial (RCT). Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and change in disease status. Open hip dislocation surgery and arthroscopic surgery are the most common surgical techniques performed on patients with femoroacetabular impingement. Systematic reviews have evaluated open hip dislocation surgery and arthroscopic surgery, compared with no comparator, nonsurgical management, and other surgical techniques. Compared with nonsurgical management, all types of surgical techniques have resulted in significant improvements in functional outcomes, pain, and radiographic measurements. The reviews were limited when comparing surgical techniques with each other because patient characteristics and outcome measurements were heterogeneous among studies. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who are children 15 years of age or younger with symptomatic femoroacetabular impingement who receive femoroacetabular impingement surgery, the evidence includes systematic reviews evaluating small observational studies and case series. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and change in disease status. While the studies reported reductions in pain and improvements in functional outcomes, the sample sizes were relatively small, with an average of 41 to 54 patients per study. Additionally, comparative studies were not identified. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who are children 15 years of age or younger with slipped capital femoral epiphysis-associated femoroacetabular impingement who receive femoroacetabular impingement surgery, the evidence includes a systematic review and small observational studies (range, 19 to 51 patients). Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and change in disease status. While most patients experienced symptom relief following femoroacetabular impingement surgery, the surgery is invasive and complications (e.g., nonunions) were reported. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have residual femoroacetabular impingement symptoms following a primary surgery who receive revision arthroscopic surgery, the evidence includes systematic reviews of observational studies (>400 patients). Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and change in disease status. Though the studies were of low-quality, consistent improvements in functional outcomes, pain relief, and patient satisfaction were reported, in some cases beyond 3 years. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

## POLICY

Open or arthroscopic treatment of femoroacetabular impingement (FAI) may be **medically necessary** when all of the following conditions have been met:

### AGE

- Candidates should be skeletally mature with documented closure of growth plates (e.g., 15 years of age or older).

### SYMPTOMS

1. Moderate-to-severe hip pain worsened by flexion activities (e.g., squatting or prolonged sitting) that significantly limits activities; AND
2. Unresponsive to conservative therapy for at least three months (including activity modifications, restriction of athletic pursuits and avoidance of symptomatic motion); AND
3. Positive impingement sign on clinical examination (pain elicited with 90° of flexion and internal rotation and adduction of the femur).

### IMAGING

- Morphology indicative of cam or pincer FAI (e.g., pistol-grip deformity, femoral head-neck offset with an alpha angle greater than 50°, a positive wall sign, acetabular retroversion [over-coverage with crossover sign]), coxa profunda or protrusion, or damage of the acetabular rim; AND
- High probability of a causal association between the FAI morphology and damage (e.g., a pistol-grip deformity with a tear of the acetabular labrum and articular cartilage damage in the anterosuperior quadrant); AND
- No evidence of advanced osteoarthritis, defined as Tonnis grade 2 or 3, or joint space of less than two mm; AND
- No evidence of severe (Outerbridge grade IV) chondral damage.

Treatment of FAI is considered **investigational** in all other situations.

## POLICY GUIDELINES

If FAI morphology is identified, patients should be advised not to play aggressive sports. It should be noted that

current imaging techniques limit the early identification of cartilage defects, whereas delay in the surgical correction of bony abnormalities may lead to disease progression to the point at which joint preservation is no longer appropriate. In addition to magnetic resonance arthrography (MRA) some clinicians may also use local anesthetic injection into the joint to assist in confirming FAI pathology.

Treatment of FAI should be restricted to centers experienced in treating this condition and staffed by surgeons adequately trained in techniques addressing FAI. Because of the differing benefits and risks of open and arthroscopic approaches, patients should make an informed choice between the procedures.

Some patients may require a revision procedure if symptoms recur or persist. Published studies have indicated that all sources of impingement might not have been identified before surgery, and those that had might not have been adequately treated. The risk of needing an additional surgical procedure can be reduced by intra-operative assessment of impingement after bone debridement and reshaping.

## BACKGROUND

### FEMOROACETABULAR IMPINGEMENT

Femoroacetabular impingement arises from an anatomic mismatch between the head of the femur and the acetabulum, causing compression of the labrum or articular cartilage during flexion. The mismatch can arise from subtle morphologic alterations in the anatomy or orientation of the ball-and-socket components (e.g., a bony prominence at the head-neck junction or acetabular overcoverage), with articular cartilage damage initially occurring from abutment of the femoral neck against the acetabular rim, typically at the anterosuperior aspect of the acetabulum. Although hip joints can possess the morphologic features of femoroacetabular impingement without symptoms, femoroacetabular impingement may become pathologic with repetitive movement and/or increased force on the hip joint. High-demand activities may also result in pathologic impingement in hips with normal morphology.

Two types of impingement, cam, and pincer, may occur alone or, more frequently, together. Cam impingement is associated with an asymmetric or nonspherical contour of the head or neck of the femur jamming against the acetabulum, resulting in cartilage damage and delamination (detachment from the subchondral bone). Deformity of the head/neck junction that looks like a pistol-grip on radiographs is associated with damage to the anterosuperior area of the acetabulum. Symptomatic cam impingement is found most frequently in young male athletes. Pincer impingement is associated with overcoverage of the acetabulum and pinching of the labrum, with pain more typically beginning in women of middle age. In cases of isolated pincer impingement, the damage may be limited to a narrow strip of the acetabular cartilage.

Epidemiologic and radiographic studies have found correlations between hip osteoarthritis and femoroacetabular impingement lesions, supporting the theory that prolonged contact between the anatomically mismatched acetabulum and femur may lead not only to cam and pincer lesions but also to further cartilage damage and subsequent joint deterioration. It is believed that osteoplasty of the impinging bone is needed to protect the cartilage from further damage and to preserve the natural joint. Therefore, if femoroacetabular impingement morphology is shown to be an etiology of osteoarthritis, a strategy to reduce the occurrence of idiopathic hip osteoarthritis could be early recognition and treatment of femoroacetabular impingement before cartilage damage and joint deterioration occurs.

An association between femoroacetabular impingement and athletic pubalgia, sometimes called sports hernia, has been proposed. Athletic pubalgia is an umbrella term for a large variety of musculoskeletal injuries involving attachments and/or soft tissue support structures of the pubis.

## Treatment

A technique for hip dislocation with open osteochondroplasty that preserved the femoral blood supply was reported by Ganz. Visualization of the entire joint with this procedure led to the identification and acceptance of femoroacetabular impingement as an etiology of cartilage damage and the possibility of correcting the abnormal femoroacetabular morphology. Open osteochondroplasty of bony abnormalities and treatment of the symptomatic cartilage defect is considered the criterion standard for complex bony abnormalities. However, open osteochondroplasty is invasive, requiring transection of the greater trochanter (separation of the femoral head from the femoral shaft) and dislocation of the hip joint to provide full access to the femoral head and acetabulum. In addition to the general adverse events of open surgical procedures, open osteochondroplasty with dislocation has been associated with nonunion and neurologic and soft tissue lesions.

Less invasive hip arthroscopy and an arthroscopy-assisted mini-approach were developed by 2004. Arthroscopy requires specially designed instruments and is considered technically more difficult due to reduced visibility and limited access to the joint space. Advanced imaging techniques, including computed tomography and fluoroscopy, have been used to improve visualization of the 3-dimensional head/neck morphology during arthroscopy.

Femoroacetabular impingement can also be a source of hip pain and decreased hip internal rotation in the pediatric population. When nonoperative management of femoroacetabular impingement in children and adolescents is ineffective, surgical procedures may be indicated. Surgical techniques include arthroscopy, open hip dislocation, limited open with arthroscopy, and osteotomy.

## SLIPPED CAPITAL FEMORAL EPIPHYSIS

Patients with slipped capital femoral epiphysis have a displaced femoral head in relation to the femoral neck within the confines of the acetabulum, which can result in hip pain, thigh pain, knee pain, and the onset of a limp. Slipped capital femoral epiphysis occurs most frequently in children between the ages of 10 to 16. Upon reaching skeletal maturity, 32% of patients diagnosed with slipped capital femoral epiphysis were found to have clinical signs of impingement. It is not uncommon for patients with slipped capital femoral epiphysis to develop premature osteoarthritis and require total hip arthroplasty within 20 years.

## Treatment

The standard treatment for slipped capital femoral epiphysis is stabilization across the physis by in situ pinning. Alternative treatments proposed for pediatric patients with slipped capital femoral epiphysis-related femoroacetabular impingement include osteoplasty without dislocation, or with the open dislocation technique described by Ganz. The Ganz technique (capital realignment with open dislocation) is technically demanding, with a steep learning curve and a high-risk of complications, including avascular necrosis. Therefore, early treatment to decrease impingement must be weighed against the increased risk of adverse events.

## REGULATORY STATUS

Surgery for treatment of femoroacetabular impingement is a procedure and, as such, is not subject to regulation by the U.S. Food and Drug Administration.

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Services that are the subject of a clinical trial do not meet our Technology Assessment and Medically Necessary Services Protocol criteria and are considered investigational. *For explanation of experimental and investigational, please refer to the Technology Assessment and Medically Necessary Services Protocol.*

It is expected that only appropriate and medically necessary services will be rendered. We reserve the right to conduct prepayment and postpayment reviews to assess the medical appropriateness of the above-referenced procedures. **Some of this protocol may not pertain to the patients you provide care to, as it may relate to products that are not available in your geographic area.**

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