Clinical Policy Title: Arthroscopic anterior cruciate ligament surgery — skeletally immature

Clinical Policy Number: CCP.1301

Effective Date: May 1, 2017
Initial Review Date: April 19, 2017
Most Recent Review Date: March 5, 2019
Next Review Date: March 2020

Related policies:

CCP.1171 Treatment of leg length discrepancy

ABOUT THIS POLICY: Prestige Health Choice has developed clinical policies to assist with making coverage determinations. Prestige Health Choice’s clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of “medically necessary,” and the specific facts of the particular situation are considered by Prestige Health Choice when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Prestige Health Choice’s clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. Prestige Health Choice’s clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Prestige Health Choice will update its clinical policies as necessary. Prestige Health Choice’s clinical policies are not guarantees of payment.

Coverage policy

Prestige Health Choice considers the use of arthroscopic anterior cruciate ligament reconstruction in skeletally immature members to be clinically proven and, therefore, medically necessary when the following criteria are met (American Academy of Orthopaedic Surgeons, 2014; LaBella, 2014):

- Skeletally immaturity confirmed with both:
  - Anterior-posterior left hand and wrist radiography.
  - Tanner stage II or III.
- Documentation of:
  - Anterior cruciate ligament injury or associated knee injury on clinical examination and imaging; magnetic resonance imaging is preferred.
  - Knee laxity.
  - Functional impairment (e.g., Lysholm Knee Scoring scale).
  - Activity level (e.g., Tegner activity level scale).
• One of the following clinical indications:
  - Unresponsive to at least six weeks of conservative therapy (See Alternative covered services).
  - Concomitant repairable meniscal tear.
  - Significant or recurring knee instability.

Limitations:

All other uses of arthroscopic anterior cruciate ligament reconstruction in skeletally immature members are not medically necessary.

Diagnostic arthroscopy as an isolated diagnostic procedure is not medically necessary. It may be medically necessary to check for associated intra-articular injuries (such as meniscal tears and chondral surface injuries) during surgical intervention for a correctable anterior cruciate ligament lesion.

Coverage determinations are subject to benefit limitations and exclusions as delineated by the state Medicaid authority. The Florida Medicaid website may be accessed at http://ahca.myflorida.com/Medicaid/

Alternative covered services:

• Activity modification.
• Functional bracing.
• Non-steroidal anti-inflammatory drug therapy.
• Instruction in self-directed exercises to strengthen the quadriceps and hamstring muscles.
• Range-of-motion exercises.
• Proprioceptive exercises.

Background

Knees that are unstable as a result of anterior cruciate ligament tears have a high chance of meniscus tears and cartilage injury that could result in permanent damage if not fixed (Accadbled, 2010). Treatment for an anterior cruciate ligament injury depends upon the patient's individual needs and injury severity. The injury is graded on a severity scale from 1 to 3. A grade 1 sprain has mild damage and the knee joint is still stable. A grade 2 sprain is a partial tear with the ligament stretched and damaged. A grade 3 sprain is a complete tear of the ligament, and it is the most common (American Academy of Orthopaedic Surgeons, 2014).

Nonsurgical treatment (e.g., bracing, physical therapy, and self-directed exercises) may be effective for patients with a stable knee or a very low activity level. Surgically, anterior cruciate ligament tears must be replaced with a tissue graft to restore stability to the knee joint. A patellar tendon, hamstring tendon,
cadaver graft, or, sometimes, quadriceps tendon can be used. Grafts are held in place with a fixation device (often a screw) by tunneling a hole in the femur and one in the tibia. Reconstruction can be performed arthroscopically or via open arthrotomy (American Academy of Orthopaedic Surgeons, 2014).

Historically, anterior cruciate ligament reconstruction was limited to skeletally mature individuals, because early growth plate closure or alignment deformities could result from surgical repair in a child who has not reached skeletal maturity. New reconstruction techniques eliminate the need to drill tunnels across the growth plate (physeal-sparing) or keep the primary fixation away from the growth plate (e.g., transphyseal), and can be customized to the growing child’s age (Accadbled, 2010; Leathers, 2015; Mall, 2014).

**Searches**

Prestige Health Choice searched PubMed and the databases of:
- UK National Health Services Centre for Reviews and Dissemination.
- Agency for Healthcare Research and Quality.
- The Centers for Medicare & Medicaid Services.
- The Cochrane Library.

We conducted searches on January 10, 2019. Search terms were: “anterior cruciate ligament reconstruction” (MeSH), “adolescent” (MeSH), “child” (MeSH), “anterior cruciate ligament” (MeSH), “anterior cruciate ligament injuries” (MeSH), and “arthroscopy” (MeSH).

We included:
- **Systematic reviews**, which pool results from multiple studies to achieve larger sample sizes and greater precision of effect estimation than in smaller primary studies. Systematic reviews use predetermined transparent methods to minimize bias, effectively treating the review as a scientific endeavor, and are thus rated highest in evidence-grading hierarchies.
- **Guidelines based on systematic reviews**.
- **Economic analyses**, such as cost-effectiveness, and benefit or utility studies (but not simple cost studies), reporting both costs and outcomes — sometimes referred to as efficiency studies — which also rank near the top of evidence hierarchies.

**Findings**

We identified five systematic reviews and meta-analyses (Dunn, 2016; Frosch, 2010; Kaeding, 2010; Ramski, 2014; Vavken, 2011), two evidence-based guidelines (American Academy of Orthopaedic Surgeons, 2014; LaBella, 2014), and no economic studies for this policy. Current evidence consists of surgical case series and a limited number of cohort studies comparing early anterior cruciate ligament surgery (open physes) to either delayed surgery (closed physes) or conservative treatment.
According to the systematic reviews, while there is no universally accepted measure of knee ligament integrity, studies integrated subjective examination techniques, objective instrumented devices, and advanced imaging in orthopedic examination. Examples included objective measurement of knee stability (e.g., the Lachman test), subjective knee function scores, and Tegner activity scores. Studies defined skeletal immaturity by Tanner stages, hand and wrist radiographs, and other parameters, in addition to chronological age, which reflects the lack of consensus in the literature and further complicates direct comparisons across studies. In general, studies included physically active children with sustained knee laxity that limited activity participation or activities of daily living. Potential harms of early anterior cruciate ligament surgery were rare and included physeal injury, graft failure, and surgical complications.

The evidence is **sufficient** to recommend early anterior cruciate ligament reconstruction in skeletally immature patients (e.g., Tanner stage II or III) with complete anterior cruciate ligament tears and knee instability that restricts function and activity levels. The strongest evidence from direct comparisons suggests that, compared to conservative or delayed treatment, early anterior cruciate ligament reconstruction in skeletally immature patients with complete tears will result in improved knee stability, knee function, activity levels, and prevention of secondary injury without affecting the growth plates or causing growth disturbances. Indirect comparisons among case series derived similar findings. Many patients initially selected for conservative treatment suffered from secondary damage and crossed over to surgical stabilization.

Guidelines from the American Academy of Orthopaedic Surgeons and the American Academy of Pediatrics support anterior cruciate ligament reconstruction for skeletally immature patients with high activity demands, who do not respond to medical treatment, with a concomitant repairable meniscal tear, or with significant or recurring instability (American Academy of Orthopaedic Surgeons, 2014; LaBella, 2014). Reconstructive surgery should be performed within five months following an isolated anterior cruciate ligament injury to avoid further knee damage, but earlier intervention may be needed for concomitant injury to multiple ligaments or the menisci. Conservative or delayed surgical treatment should be reserved for very compliant patients with joint stability, low demands, and no other pathologies. Rehabilitation should focus on returning motion to the joint and surrounding muscles, strengthening the surrounding muscles to protect the new ligament, and returning function tailored to the patient’s needs.

The evidence is **insufficient** to assess the relative effectiveness of various surgical techniques or types of grafts. Three types of surgical procedures are presented in the current literature: intra-articular, transphyseal, transosseous reconstruction; intra-articular, physeal-sparing, transosseous reconstruction; and combined intra- and extra-articular, physeal-sparing, extraosseous stabilization (Vavken, 2011). Evidence from direct and indirect comparisons suggest no differences in patient-reported outcomes, anterior-posterior laxity, leg-length discrepancy, or angular deformities between physeal-sparing and transphyseal reconstruction.
Policy updates:

In 2018, we added two systematic reviews comparing transphyseal and physeal-sparing techniques in the skeletally immature (Longo, 2017; Pierce, 2017). Their findings are consistent with previous findings, and no policy changes are warranted.

In 2019, we added two systematic reviews (Kay, 2018; Tovar-Cuellar, 2018) to the policy. The results are consistent with previous findings, and no policy changes are warranted.

References

Professional society guidelines/other:


Peer-reviewed references:


**Centers for Medicare & Medicaid National Coverage Determinations:**

No National Coverage Determinations identified as of the writing of this policy.

**Local Coverage Determinations:**

No Local Coverage Determinations identified as of the writing of this policy.

**Commonly submitted codes**

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.
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