KAISER PERMANENTE®

Kaiser Foundation Health Plan of Washington

Clinical Review Criteria
Knee Arthroscopy Procedures

- Allogeneic Meniscal Transplant
- Autologous Chondrocyte Implantation (ACI)
- Collagen meniscus Implant
- Knee Arthroscopy
- Matrix Autologous Chondrocyte Implantation (MACI)
- Meniscal Allograft Transplant
- Mosaicplasty
- Osteochondral Autograft Transfer System (OATS)

Criteria

For Medicare Members

Source	Policy
CMS Coverage Manuals	None
National Coverage Determinations (NCD)	Arthroscopic Lavage and Arthroscopic Debridement for the Osteoarthritic Knee (150.9)
Local Coverage Determinations (LCD)	None
Local Coverage Article (LCA)	None
Kaiser Permanente Medical Policy	Due to the absence of an active NCD, LCD, or other coverage guidance, Kaiser Permanente has chosen to use their own Clinical Review Criteria, "***Autologous Chondrocyte Implantation," "Allogeneic Meniscal Transplant***," "***Osteochondral Autograft Transfer System (OATS),"*** "***Mosaicplasty***," "***Matrix Autologous Chondrocyte Implantation (MACI)***," for medical necessity determinations. Use the Non-Medicare criteria below.

For Non-Medicare Members

Service	Criteria
Knee Arthroscopy	**Effective until January 1st, 2025** Medical necessity review not required Reviewed for Site of Care/Level of Care **Effective January 1st, 2025** Reviewed for Site of Care/Level of Care **AND** Kaiser Permanente has elected to use the MCG* **Knee Arthroscopy KP-S-705 01012025** for medical necessity determinations. This service is not covered per MCG guidelines. For access to the MCG Clinical Guidelines

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	criteria, please see the MCG Guideline Index through the provider portal under Quick Access.
Osteochondral Autograft Transfer System (OATS) or Mosaicplasty *27416, 29866* Microfracture (MFX)* *29879*	**Effective until January 1st, 2025** Medical necessity review not required **Effective January 1st, 2025** Reviewed for Site of Care/Level of Care **AND** Kaiser Permanente has elected to use the MCG* **Knee Arthroscopy KP-S-705 01012025** for medical necessity determinations. This service is not covered per MCG guidelines. For access to the MCG Clinical Guidelines criteria, please see the MCG Guideline Index through the provider portal under Quick Access.
Autologous Chondrocyte Implantation (ACI) **Matrix Autologous Chondrocyte Implantation (MACI)**	**Effective until January 1st, 2025** Reviewed Level of Care **AND** Autologous chondrocyte implantation (ACI) or autologous chondrocyte transplantation (ACT) using the MACI™ implant is considered medically necessary when **ALL** of the following criteria have been met: • Documentation should support why an alternative cartilage restoration procedure such as OATS are contraindicated • Symptomatic single or multiple full-thickness cartilage defects of the femoral condyle, patella, or trochlea with normal surrounding cartilage (Modified Outerbridge Classification grade III or IV*) and no evidence of degenerative disease such as osteoarthritis • Severe disabling knee pain limiting ambulation • Absence of systemic disease (gout, rheumatoid arthritis, etc.) • Failure of at least 3 months of provider-directed conservative therapy such as physical therapy, braces, and/or nonsteroidal anti-inflammatory drugs (NSAIDs) • Patient is skeletally mature (closed growth plates) and not a candidate for arthroplasty (age 15 – 55) • Knee is stable with intact or reconstructed ligaments (ACL or PCL) and menisci. A concurrent ligament stabilization or meniscal procedure at the time of ACI would be acceptable • No more than 50% partial meniscectomy in the target knee • Defect(s) are unipolar – there is no corresponding kissing lesion on facing cartilage • Lesion is greater than 1.0cm^{2**} (too large for bone stimulation) and less than 10cm^2, or the lesion is less than 1.0cm^2 and patient has previously failed marrow stimulation for that lesion • Has not had any knee joint surgery within the past 3 months (excluding surgery to procure a biopsy or a concomitant procedure to prepare the knee for a MACI implant) • Normal tibial-femoral and/or patella-femoral alignment based on weight-bearing alignment x-rays, or osteotomy is planned • BMI less than or equal to 35 • Patient is able and willing to follow post-operative protocol (6 weeks limited weight bearing) • Must be authorized by Kaiser Permanente Medical Director in consultation with Orthopedics *Modified Outerbridge Classification

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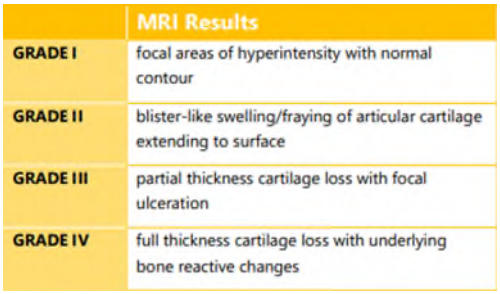
<table>
<tr><td></td><td>The Outerbridge classification is a grading system for joint cartilage breakdown.
 
<table>
<tr><th></th><th>MRI Results</th></tr>
<tr><td>GRADE I</td><td>focal areas of hyperintensity with normal contour</td></tr>
<tr><td>GRADE II</td><td>blister-like swelling/fraying of articular cartilage extending to surface</td></tr>
<tr><td>GRADE III</td><td>partial thickness cartilage loss with focal ulceration</td></tr>
<tr><td>GRADE IV</td><td>full thickness cartilage loss with underlying bone reactive changes</td></tr>
</table>
**Lesions less than 1.0cm^2 should be treated with marrow stimulation

Effective January 1st, 2025
Reviewed Level of Care
AND
Kaiser Permanente has elected to use the MCG* Knee Arthroscopy KP-S-705 for medical necessity determinations. This service is not covered per MCG guidelines. For access to the MCG Clinical Guidelines criteria, please see the MCG Guideline Index through the provider portal under Quick Access.</td></tr>
<tr><td>Allogenic Meniscal Transplant</td><td>Kaiser Permanente has elected to use the MCG* Meniscal Allograft Transplant (A-0216) for medical necessity determinations. This service is not covered per MCG guidelines. For access to the MCG Clinical Guidelines criteria, please see the MCG Guideline Index through the provider portal under Quick Access.</td></tr>
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***MCG manuals are proprietary and cannot be published and/or distributed**. However, on an individual member basis, Kaiser Permanente can share a copy of the specific criteria document used to make a utilization management decision. If one of your patients is being reviewed using these criteria, you may request a copy of the criteria by calling the Kaiser Permanente Clinical Review staff at 1-800-289-1363 or access the MCG Guideline Index using the link provided above.

If requesting this service (*or these services*), please send the following documentation to support medical necessity:

- Last 6 months of clinical notes from requesting provider &/or specialist

The following information was used in the development of this document and is provided as background only. It is provided for historical purposes and does not necessarily reflect the most current published literature. When significant new articles are published that impact treatment option, Kaiser Permanente will review as needed. This information is not to be used as coverage criteria. Please only refer to the criteria listed above for coverage determinations.

Background

Knee arthroscopy is a minimally invasive surgical procedure that allows surgeons to examine the inside o the knee joint to diagnose and treat a variety of knee problems. Knee arthroscopy is one of the most common procedures used to diagnose and treat knee injuries. It's usually performed on an outpatient basis, and patients can typically go home within a few hours after the procedure.

During the procedure, the surgeon makes 2-3 small incisions around the knee and inserts a small, pencil-sized camera, called an arthroscope, into the joint. The arthroscope contains a small lens and lighting system to magnify and illuminate the structures inside the joint. The surgeon attaches the arthroscope to a miniature camera that displays pictures on a video monitor. The surgeon uses these images to guide miniature surgical instruments to examine the bones, cartilage, and ligaments of the knee, and to repair or correct various problems or injuries.

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Autologous Chondrocyte Implantation for Treatment of Defects in Articular Cartilage of the Knee

Articular hyaline cartilage is a highly specialized connective tissue that covers the surface of bone in synovial joints. It is a 2-4mm thick hyaline cartilage that provides smooth low friction movement and shock absorption. Unlike most tissues, articular cartilage does not have blood vessels, nerves, or lymphatics. It is composed of a dense extracellular matrix (ECM) with a sparse distribution of highly specialized cells called chondrocytes. The ECM is principally composed of water, collagen, and proteoglycans, with other non-collagenous proteins and glycoproteins present in lesser amounts. These components help to retain water within the ECM, which is critical to maintain the unique mechanical properties of the cartilage (Fox 2009, Negrin 2013, Oussedik 2015).

The articular cartilage is prone to damage from acute high energy trauma and from repetitive shear and torsional forces applied to the surface. Lesions to the articular cartilage are often associated with pain and compromised joint function and may lead to the development and progression of osteoarthritis. The damaged cartilage has very limited capacity for self-repair due to its avascular and hypocellular nature. Surgery has thus been the standard approach for repairing articular cartilage damage. Surgical techniques intended for restoring the articular surface are classified into 3 categories: 1. Marrow stimulation procedures such as microfracture, 2. Cell-based implantation, and 3. Osteochondral grafting. Surgical interventions have also been categorized as 1. Reparative, which includes marrow stimulation such as microfracture; drilling; and abrasion arthroplasty, and 2. Reconstructive that includes allograft transplantation; osteochondral autograft transplantation (OAT); and autologous chondrocyte implantation (ACI). Investigators suggest that microfracture surgeries is more effective than reconstructive surgeries for the repair of smaller cartilage defects (<100mm2) while reconstructive surgeries are more effective for larger defects (>100mm2) (Crawford 2012, Perera 2012, Negrin 2013, Mundi 2015, Li 2015).

Currently, marrow stimulation through microfracture is the standard first-line surgical treatment for articular cartilage lesions of the knee. The microfracture technique was developed by Steadman in the early 1980s. It is a single-stage arthroscopic procedure that involves penetrating the subchondral bone plate after removing the damaged hyaline cartilage. Bleeding from the subchondral bone forms a clot that attracts bone marrow cells to migrate into the cartilage defect and create a ‘super clot’ that eventually matures into a firm repair tissue consisting of a combination of fibrous and hyaline-like cartilage. The technique is minimally invasive, technically simple, and is associated with low morbidity. However, the repair is composed of fibrocartilaginous tissue, which is mechanically inferior to the native hyaline cartilage; it has less ability to withstand shock and shearing forces leading to deterioration in function over time. In addition, the bone marrow stem cells and growth factors are released into the joint rather than being contained in the site of the defect. Some researchers suggest that microfracture is more effective in reducing pain and improving joiny function when performed for new injuries, small focal injuries, and in younger individuals with lower body mass index (Crawford 2012, Negrin 2013, Lee 2014, Mundi 2015).

Osteochondral autograft transfer (OAT), also known as osteochondral cylinder transplantation or mosaicplasty, is a whole tissue transplantation procedure that was developed in the 1990s for hyaline cartilage repair. It is a surgical technique that uses osteochondral grafts taken from the lighter-load bearing areas of the patient’s own joint to fill the focal defects. There is a concern however, with the donor site morbidity, and thus the technique may not recommend for lesions larger than 400mm2 (Li 2015, Mundi 2015).

Autologous chondrocyte implantation (ACI), also known as autologous chondrocyte transplantation is a cell-based method that was introduced in the late 1980s for the treatment of symptomatic full thickness cartilage defects of the knee. The first generation of ACI (ACI-P) is a two-stage procedure. First, a cartilage biopsy is harvested from healthy cartilage of the affected knee during an arthroscopic biopsy procedure. The specimen of live articular cartilage is sent to a cell expansion laboratory for chondrocyte culture. The cells are separated from the cartilage under a strictly controlled environment, and then multiplied using a cell-culture technique for 3-6 weeks. The cultured chondrocytes are then implanted into the cartilage defect in an open arthrotomy procedure. This procedure involves removing a periosteal flap from the proximal medial tibia, suturing it to the surrounding rim of normal tissue, and implanting the expanded chondrocytes beneath the flap to start filling the defect by producing a matrix. Unlike the MS techniques, it is reported that ACI has the ability of repairing the defect by a hyaline-like cartilage with a hybrid of fibrocartilage and hyaline like tissue, or with fibrocartilaginous material containing type-1 and type II collagen. ACI-P is an invasive, technically complicated procedure that involves two operations, has a long recovery time, and requires extensive post-surgical rehabilitation. The technique has variable success rate

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and may be associated with periosteal hypertrophy and overgrowth that would require additional surgeries (Crawford 2012, Niemeyer 2014, Mundi 2015).

Several modifications to the first generation ACI-P have been made to reduce the procedural technical demands associated with the tissue harvest and the use of periosteal flap in order to decrease the surgical morbidity and prevent periosteal hypertrophy and overgrowth. These modifications were described as second and third generations. The second generation ACI (ACI-C) uses bioengineered bilayer collagen covers to substitute for the periosteal flap and avoid the spill over and asymmetric distribution of chondrocytes following implantation. The third generation ACI explores the use of biomaterials to construct a 3-dimensional scaffold for chondrocyte implantation; the all-in-one grafts do not need a periosteal cover or fixing stitches and can be trimmed to fit the cartilage defect with fibrin glue. It has been reported that implantation of third generation ACI can be performed arthroscopically or with a small incision (Vasiliadis 2010, Kuroda 2011, Crawford 2012, Negrin 2013, Mundi 2015, Samsudin 2015).

Allogeneic Meniscal Transplant

The knee meniscus is a fibrocartilaginous crescent-shaped structure that plays an important part in the biomechanics of the joint. It functions as load bearing, shock absorption, stabilization of the joint as well as lubrication. Partial or complete loss of the meniscus alters the joint function and predisposes the articular cartilage to degenerative changes. In the past, total or subtotal meniscectomy was routinely performed for patients with meniscal tears. More recently, repair of the meniscus has become the standard treatment for tears. If un-repairable, arthroscopic partial meniscectomy of only the torn segments is recommended (Yoldas 2003). Subtotal or complete meniscectomy is however performed when the entire meniscus is torn and irreparable. Meniscectomy leads to deterioration of the articular cartilage and narrowing of the knee joint. Allograft meniscal transplantation has become an option for these patients and is believed to prevent progression of degenerative changes of the knee.

The first meniscal allograft was performed in 1984 by Milachowski and Wirth. The technique of the transplantation has evolved over the years, and different graft types were used. These include meniscus prosthesis, scaffolds, genetically engineered tissue, meniscus xenografts, meniscus autografts, and meniscus allografts. The allografts used are fresh, fresh-frozen, lyophilized, or cryopreserved menisci. Fresh menisci are thought to be superior as the architecture is unchanged, and chondrocytes and other cells are still viable. However, fresh grafts are logistically difficult to obtain. Fresh-frozen and cryopreserved menisci are reported to have good results but are associated with storage and availability problems. The Lyophilized and freeze-dried menisci can be stored for a long time but have the disadvantage of the decay of ground substance and destruction of the architecture in the freeze-dried menisci, and shrinkage in the lyophilized. Cryopreservation may maintain fibrochondrocytes for 2-4 weeks but is very expensive in cost. The success of the transplantation depends on the revascularization and the cell proliferation for the restitution of the lost ground substance. Sizing of the meniscus before transplantation is also important to have a good geometrical fit in the joint, and a proper function.

The indications of the transplantation are not well defined. Persistent pain after meniscectomy is a common indication. Some authors believe that a knee with minimal or no arthritic changes is the ideal for transplantation, and others indicate it only for knees with degenerative changes. Some investigators in the US (Felix N, and Paulos L 2003), indicate meniscal transplantation for those <40 years old, with pain and swelling not responding to conservative treatment, minimal degenerative changes, stable knee, and axial alignment. In other countries e.g., Germany (Peters 2003) the indications include total meniscectomy with early arthritis, loss of anterior cruciate ligament, concomitant osteotomy, and prophylactic transplantation. It is contraindicated in patients with severe degenerative changes in the joint, instability, malalignment, and history of infection of the joint.

Medical Technology Assessment Committee (MTAC)

Autologous Chondrocyte Implantation

02/14/2001: MTAC REVIEW

Evidence Conclusion: The existing evidence is not sufficient to determine the effect of ACI on health outcomes. The only data available are from case series report that have compromised validity and are not considered to provide high quality data. Each of the two case series articles evaluated had additional limitations beyond study type including providing little information about possible adverse effects. Peterson and colleagues are involved with a prospective randomized trial of autologous chondrocyte transplantation compared to periosteum alone or subchondral drilling for the treatment of primary chondral lesions of the femoral condyle. Results of this study will provide higher-quality data.

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Articles: Fourteen articles were identified. Eleven articles were not directly relevant, did not include clinical outcomes or were review articles; three articles presented empirical data on clinical outcomes. Articles were selected based on study type. There were no meta-analyses or randomized controlled trials. The three empirical articles were all case series. Sample sizes were 8 patients, 44 patients and 94 patients. An evidence table was created for the two-case series reports with the largest number of patients: Peterson L, Minas T, Brittberg M, Nilsson A, Sjogren-Jansson E, Lindahl, A. Two-to-9-year outcome after autologous chondrocyte transplantation of the knee. Clin Orthop 2000; 374: 212-234. See Evidence Table. Minas T. Chondrocyte implantation in the repair of chondral lesions of the knee: Economics and quality of life. Am J Orthop 1998; 27: 739-44. See Evidence Table.

The use of Autologous Chondrocyte (Carticel®) Implantation for Treatment of Defects in Articular Cartilage of the Knee does not meet the *Kaiser Permanente Medical Technology Assessment Criteria.*

04/17/2003: MTAC REVIEW
Autologous Chondrocyte Implantation
Evidence Conclusion: There were two small randomized controlled trials (Bentley et al, n=100.; Horas et al., n=40). Neither provided strong evidence that autologous chondrocyte implantation is superior to an alternate procedure for repairing osteochondral defects in the knee. The Bentley study was larger and had stronger methodology. The authors found that the overall clinical results did not differ significantly between groups (autologous chondrocyte implantation compared to mosaicplasty), but that, among the 51 patients with medial femoral defects, the autologous chondrocyte group had better post-operative knee function. The one-year arthroscopic data in the Bentley study was compromised because 40% of patients were missing from the analysis. The Horas study had inadequate randomization and several additional threats to validity. They found worse post-operative knee instability in the autologous chondrocyte transplantation group compared to a group receiving autologous osteochondral cylinder transplantation and no significant differences between groups on the two other primary measures.
Articles: Bentley G, Biant LC, Carrington RWJ et al. A prospective, randomized comparison of autologous chondrocyte implantation versus mosaicplasty for osteochondral defects in the knee. *J Bone Joint Surg (Br)* 2003; 85-B: 223-230. See Evidence Table. Horas U, Pelinkovic D, Aigne T, Schnettler R. Autologous chondrocyte implantation and osteochondral cylinder transplantation in cartilage repair of the knee joint. *J Bone Joint Surg (Br)* 2003; 85-A: 185-192.See Evidence Table.

The use of Autologous Chondrocyte (Carticel®) Implantation for Treatment of Defects in Articular Cartilage of the Knee does not meet the *Kaiser Permanente Medical Technology Assessment Criteria.*

07/14/2004: MTAC REVIEW
Autologous Chondrocyte Implantation
Evidence Conclusion: The evidence consists of three controlled trials (2 randomized, 1 pseudo-randomized), all comparing autologous chondrocyte implantation to other surgical procedures to restore articular cartilage. There are no sham controlled studies. None of the studies found significantly better clinical outcomes with ACI compared to the alternative intervention 1-2 years post-surgery; some may have been underpowered. Knutsen et al, the strongest study methodologically, found better results for the group receiving microfracture on one key outcome, the physical component score of the SF-36. The Bentley study found better histological results in the ACI group, but this analysis included only 60% of the randomized patients. In summary, ACI does not provide a clear clinical advantage over other surgical procedures to heal cartilage injuries and may be inferior to microfracture.
Articles: The Medline search yielded 42 articles, many of which were on technical aspects of the procedure or on related technologies. There were three randomized controlled trials and all three were critically appraised. References are as follows: Knutsen G, Engebretsen L, Ludvigsen TC. Autologous chondrocyte implantation compared with microfracture in the knee. *J Bone Joint Surg* 2004; 86-A: 455-464. See Evidence Table.

The use of Autologous Chondrocyte (Carticel®) Implantation for Treatment of Defects in Articular Cartilage of the Knee does not meet the *Kaiser Permanente Medical Technology Assessment Criteria.*

06/05/2006: MTAC REVIEW
Autologous Chondrocyte Implantation
Evidence Conclusion: One new RCT compared autologous chondrocyte implantation to an alternative procedure. The study (Dozin et al., 2005) did not find a significant difference in the clinical success rate of patients who received ACI or mocaicplasty. The study was underpowered to detect a clinically meaningful difference

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between groups due to low compliance rate. Only 12/22 (54%) in the ACI group and 11/22 (50%) in the mosaicplasty group actually received the surgery, which occurred 6 months after an initial debridement. The best evidence on ACI for treatment of defects in articular cartilage of the knee remains the randomized controlled trials reviewed in 2004. The conclusion from the previous MTAC report was: The evidence consists of three controlled trials (2 randomized, 1 pseudo-randomized), all comparing autologous chondrocyte implantation to other surgical procedures to restore articular cartilage. There are no sham controlled studies. None of the studies found significantly better clinical outcomes with ACI compared to the alternative intervention 1-2 years post-surgery; some may have been underpowered. Knutsen et al, the strongest study methodologically, found better results for the group receiving microfracture on one key outcome, the physical component score of the SF-36. The Bentley study found better histological results in the ACI group, but this analysis included only 60% of the randomized patients. In summary, ACI does not provide a clear clinical advantage over other surgical procedures to heal cartilage injuries and may be inferior to microfracture. A 2005 technology assessment conducted by the National Institute for Health and Clinical Effectiveness (NICE) in England concluded that there is inconsistent evidence on the clinical effectiveness of ACI and did not recommend ACI except in the context of ongoing clinical trials.
Articles: Three new randomized controlled trials were identified. Two trials, one by Bartlett and colleagues and the other by Gooding and colleagues, were not evaluated further because they compared two types of autologous chondrocyte replacement and did not include a control group that received an intervention other than ACI. (In addition, the Gooding study was only available as an abstract). The other trial compared ACI and mosaicplasty and was critically appraised: Dozin B, Malpeli M, Cancedda R et al. Comparative evaluation of autologous chondrocyte implantation and mosaicplasty. Clin J Sport Med 2005; 15: 220-226. See Evidence Table.

The use of Autologous Chondrocyte (Carticel®) Implantation for Treatment of Defects in Articular Cartilage of the Knee does not meet the *Kaiser Permanente Medical Technology Assessment Criteria.*

03/21/2016: MTAC REVIEW
Autologous Chondrocyte Implantation (Autologous Chondrocyte Transplantation) For the Treatment of Chondral Defects in the Knee
Evidence Conclusion: There is insufficient published evidence from adequately powered large RCTs with valid methodology and long-term follow-up duration to determine that ACI and its newer generations are superior to other surgical techniques in repairing articular defects of the knee. The variations between the published studies make it difficult to accurately compare one intervention versus another or to determine the optimal procedure and technique for the individual patient. The literature suggests but does not provide sufficient evidence that the newer generations of ACI may be associated with better long-term outcomes compared to microfracture in patients with larger full thickness, focal chondral defects in the knee.
Articles: The literature search revealed a large number of experimental and observational studies on autologous chondrocyte implantation. Several small randomized controlled studies compared one or more generation ACI with MF, with OAT, or versus another ACI generation. The search also identified a number of systematic reviews with or without meta-analyses on ACI compared to one or more of the other treatment modalities. The more recent meta-analysis comparing ACI with microfracture (Negrin, 2013), a meta-analysis comparing ACI to OAT (Li, 2015), an analysis comparing all three procedures (Mundi, 2015) were selected for critical appraisal. Studies comparing one generation ACI to another generation were excluded from the review. Mundi R, Bedi A, Chow L, Crouch S3 Cartilage Restoration of the Knee: A Systematic Review and Meta-Analysis of Level 1 Studies. *Am J Sports Med.* 2015 Jul 2. pii: 0363546515589167. See Evidence Table. Negrin LL, Vécsei V. Do meta-analyses reveal time-dependent differences between the clinical outcomes achieved by microfracture and autologous chondrocyte implantation in the treatment of cartilage defects of the knee? *Orthop Sci*. 2013 Nov; 18(6):940-948. See Evidence Table. Li Z, Zhu T, Fan W. Osteochondral autograft transplantation or autologous chondrocyte implantation for large cartilage defects of the knee: a meta-analysis. *Cell Tissue Bank*. 2015 Jun 12. See Evidence Table.

The use of Autologous Chondrocyte Implantation (Autologous Chondrocyte Transplantation) For the Treatment of Chondral Defects in the Knee does not meet the *Kaiser Permanente Medical Technology Assessment Criteria.*

07/12/2021: MTAC REVIEW
Matrix-Induced Autologous Chondrocyte Implantation (MACI) for the Repair of Articular Cartilage of the Knee
Evidence Conclusion:
Hayes Review: A large, moderate-quality body of evidence suggests that MACI is associated with improved symptoms, function, QOL, and ability to perform normal ADL for young and middle-aged and typically nonobese

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adults with symptomatic articular cartilage defects of the knee. Evidence also suggests that benefits may be durable beyond follow-up periods of 5 years. The evidence consistently favors MACI over MFX, and more limited evidence suggests that MACI and older-generation ACI procedures have similar clinical benefit. Evidence comparing MACI with other surgical procedures was too limited to draw conclusions. Although the majority of studies reported few safety concerns, additional studies are needed to further evaluate the comparative safety of MACI. There remains uncertainty as to when MACI is optimally prescribed in the chondral defect treatment hierarchy, and definitive patient selection criteria have not been clearly elucidated.

INTC recommendations/statements: There is sufficient evidence to determine that the technology improves net health outcomes for select patients. There is insufficient evidence regarding the efficacy and safety of the technology as compared to alternative procedures for the indication. The existing evidence regarding how the technology effectively prevents or diagnoses or treats or manages the health condition is of insufficient quantity and/or quality. The existing evidence regarding how the technology effectively prevents or diagnoses or treats or manages the health condition is conflicting or inconsistent. There is **no** evidence on the use of this technology in the prevention or diagnosis or treatment or management of this health condition. There is sufficient evidence to determine that the technology does not improve net health outcomes for any patients.

07/14/2004: MTAC REVIEW
Allogeneic Meniscal Transplant
Evidence Conclusion: The results of the studies reviewed are promising but do not provide sufficient evidence, on the effectiveness of the meniscal allograft transplantation in restoring the knee function and preventing degenerative osteoarthritis. The prospective study, the two-case series appraised, as well as the other published case series and reports were small, included heterogeneous patients at different ages, and with different indications for the meniscal transplantation. None of the studies used a consistent protocol. The grafts used were fresh, deep-frozen, cryopreserved, or lyophilized allografts. The duration from the meniscectomy to the transplant varied among patients from few months to more than 30 years. In several reports and within studies some patients received an anterior cruciate ligament repair, together with the meniscal transplant. In others, patients underwent different procedures after the transplantation. The rehabilitation programs varied between and within studies, as well as the duration of follow-up. Overall the results of the studies show that meniscal transplantation may alleviate pain and improve the knee function. However, there is insufficient data to determine which patients will benefit most, and if benefits observed would be maintained over time, and whether the transplantation will prevent degenerative changes from occurring within the joint.
Articles: The search yielded 75 articles many of which were review articles. There were no meta-analyses or randomized controlled trials. One prospective cohort study and several case series reports with limited number of patients were identified. The prospective cohort study and two case series reports were selected for critical appraisal. Selection for the case series reports for review was based on the population size, duration of follow-up, and/or primary outcomes. *Evidence tables were created for the following studies:*
Wirth CJ, Peters G, Milachowaski KA, et al. Long-term results off meniscal allograft transplantation. *Am J Sports Med* 2002;30:174-181.See Evidence Table van Arkel ERA, and de Boer HH. Survival analysis of human meniscal transplantations. *J Bone Joint Surg* 2002;84-B:227-31. See Evidence Table Rath E, Richmond JC, Yassir W et al. Meniscal allograft transplantation. Two-to eight-year results. *Am J Sports Med* 2001; 29:174-181. See Evidence Table

The use of allogeneic meniscal transplant in the treatment of knee pain and swelling does not meet the *Kaiser Permanente Medical Technology Assessment Criteria*.

Applicable Codes

Considered Medically Necessary when criteria in the applicable policy statements listed above are met

CPT® or HCPC Codes	Description
29867	Arthroscopy, knee, surgical; osteochondral allograft (eg, mosaicplasty)
29870	Arthroscopy, knee, diagnostic, with or without synovial biopsy (separate procedure)
29871	Arthroscopy, knee, surgical; for infection, lavage and drainage
29873	Arthroscopy, knee, surgical; with lateral release

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29874	Arthroscopy, knee, surgical; for removal of loose body or foreign body (eg, osteochondritis dissecans fragmentation, chondral fragmentation)
29875	Arthroscopy, knee, surgical; synovectomy, limited (eg, plica or shelf resection) (separate procedure)
29876	Arthroscopy, knee, surgical; synovectomy, major, 2 or more compartments (eg, medial or lateral)
29877	Arthroscopy, knee, surgical; debridement/shaving of articular cartilage (chondroplasty)
29880	Arthroscopy, knee, surgical; with meniscectomy (medial AND lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed
29881	Arthroscopy, knee, surgical; with meniscectomy (medial OR lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed
29882	Arthroscopy, knee, surgical; with meniscus repair (medial OR lateral)
29883	Arthroscopy, knee, surgical; with meniscus repair (medial AND lateral)
29884	Arthroscopy, knee, surgical; with lysis of adhesions, with or without manipulation (separate procedure)
29885	Arthroscopy, knee, surgical; drilling for osteochondritis dissecans with bone grafting, with or without internal fixation (including debridement of base of lesion)
29886	Arthroscopy, knee, surgical; drilling for intact osteochondritis dissecans lesion
29887	Arthroscopy, knee, surgical; drilling for intact osteochondritis dissecans lesion with internal fixation
29888	Arthroscopically aided anterior cruciate ligament repair/augmentation or reconstruction
29889	Arthroscopically aided posterior cruciate ligament repair/augmentation or reconstruction

Allogeneic Meniscal Transplant
Considered Not Covered

CPT® or HCPC Codes	Description
29868	Arthroscopy, knee, surgical; meniscal transplantation (includes arthrotomy for meniscal insertion), medial or lateral

Osteochondral Autograft Transfer System (OATS) or Mosaicplasty 27416, 29866 Microfracture (MFX)
Effective until January 1st 2025: Does not currently Require Medical Review

CPT® or HCPC Codes	Description
27416	Osteochondral autograft(s), knee, open (eg, mosaicplasty) (includes harvesting of autograft[s])
29866	Arthroscopy, knee, surgical; osteochondral autograft(s) (eg, mosaicplasty) (includes harvesting of the autograft[s])
29879	Arthroscopy, knee, surgical; abrasion arthroplasty (includes chondroplasty where necessary) or multiple drilling or microfracture

Osteochondral Autograft Transfer System (OATS) or Mosaicplasty 27416, 29866 Microfracture (MFX)
Effective January 1st 2025: considered medically necessary when criteria in applicable policy statements listed above are met

CPT® or HCPC Codes	Description
27416	Osteochondral autograft(s), knee, open (eg, mosaicplasty) (includes harvesting of autograft[s])
29866	Arthroscopy, knee, surgical; osteochondral autograft(s) (eg, mosaicplasty) (includes harvesting of the autograft[s])
29879	Arthroscopy, knee, surgical; abrasion arthroplasty (includes chondroplasty where necessary) or multiple drilling or microfracture

Autologous Chondrocyte Implantation (ACI)
Matrix Autologous Chondrocyte Implantation (MACI)

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Considered Medically Necessary when criteria in the applicable policy statements listed above are met

CPT® or HCPC Codes	Description
27412	Autologous chondrocyte implantation, knee
J7330	Autologous cultured chondrocytes, implant S2112 Arthroscopy, knee, surgical for harvesting of cartilage (chondrocyte cells)
S2112	Arthroscopy, knee, surgical for harvesting of cartilage (chondrocyte cells)

***Note:** Codes may not be all-inclusive. Deleted codes and codes not in effect at the time of service may not be covered.

****To verify authorization requirements for a specific code by plan type, please use the **Pre-authorization Code Check**.

Date Created	Date Reviewed	Date Last Revised
08/02/2024	08/06/2024[MPC],	08/06/2024

[MPC] Medical Policy Committee

Revision . History	Description
08/02/2024	Merge Knee Surgical Procedures into one criteria set (Osteochondral Autograft Transfer System (OATS), Mosaicplasty, Autologous Chondrocyte Implantation (ACI), Matrix Autologous Chondrocyte Implantation (MACI), Allogeneic Meniscal Transplant, Meniscal Allograft Transplant)
08/06/2024	MPC approved to adopt the Knee Arthroscopy KP-S-705 01012025 for medical necessity determinations. Effective January 1st, 2025. 60-day notice required.

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