Clinical Policy: Articular Cartilage Defect Repairs

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Coding Implications
Revision Log

Description

Cartilage transfer procedures include autologous chondrocyte implantation, osteochondral allograft transplantation (OAG or OCA) [i.e., including repair of anterior cruciate ligament and meniscus], and osteochondral autograft transplantation [mosaicplasty, Osteochondral Autograft Transplantation System (OATS)]. They are techniques for repairing articular cartilage that has been damaged by trauma or degenerative processes. This policy outlines the medical necessity criteria for each of these procedures.

Policy/Criteria

I. It is the policy of Pennsylvania Health and Wellness® (PHW) that autologous chondrocyte implantation (ACI) is **medically necessary** when *all* of the following criteria are met:

A. Age 18 – 55 years, or documented skeletal maturity if < 18;
B. BMI < 35 cm/M^2;
C. Focal, full-thickness (grade III or IV) articular cartilage defect involving the femoral condyle (medial, lateral, or trochlear);
D. Femoral condyle defect size 1–10 cm^2;
E. Disabling symptoms such as locking, swelling, or knee pain that is unresponsive to conservative treatment for a minimum of 2 months (e.g., medication, physical therapy) AND arthroscopic or other surgical repair;
F. Knee is stable with intact menisci and ligaments, has normal joint space by X-ray, and is in good alignment (a corrective procedure to stabilize the knee may be performed in combination with or prior to autologous chondrocyte implantation [ACI]);
G. Surgery is not intended to treat osteoarthritis of the knee;
H. Patient is willing and able to comply with prescribed postoperative rehabilitative program.

II. It is the policy of PHW that osteochondral allograft transplant OR osteochondral autograft transplant of the knee is considered **medically necessary** when *all* of the following criteria are met:

A. Focal, full-thickness (grade III or IV) articular cartilage defect of the lateral or medial femoral condyle, or trochlear region of the knee;
B. For osteochondral autograft transplant (e.g., OATS/Mosaicplasty), lesion is ≤ 2 cm^2; or for osteochondral allograft transplant (e.g., OCA), lesion is > 2cm^2;
C. Disabling symptoms such as locking, swelling, or knee pain that is unresponsive to conservative treatment for a minimum of two months (medication, physical therapy);
D. No evidence of arthritis on the corresponding tibial surface;
E. Normal appearing hyaline cartilage surrounding the border of the defect; and absent or minimal changes in surrounding articular cartilage;
F. Normal knee alignment;
G. Not currently a candidate for total or partial knee replacement.

III. It is the policy of PHW that meniscal allograft transplant is considered **medically necessary** when all of the following criteria are met:
- A. Physically active and physiologically young, under age 55;
- B. Documented mild to moderate articular damage (Outerbridge grade II or less);
- C. Missing > 50% of a meniscus as a result of previous surgery or injury, or a meniscus tear that cannot be repaired;
- D. Disabling knee pain refractory to conservative treatment;
- E. Normal alignment without varus or valgus deformities;
- F. None of the following contraindications to meniscal allograft transplant:
  1. Systemic metabolic degenerative disease; (i.e., gout);
  2. Arthritis of the knees or rheumatoid arthritis;
  3. Flattening of the femoral condyles or severe degenerative changes (greater than 50% joint space narrowing, bone on bone, or erosion to subchondral bone);
  4. Patients who have undergone partial or total meniscectomy and do not presently have symptoms or problems with their knee.

IV. It is the policy of PHW that minced articular cartilage repair (allograft or autograft) is considered investigational because effectiveness has not been established.

V. It is the policy of PHW that ACI, osteochondral allograft transplant, or osteochondral autograft transplant for any other indication or any other joint surface not listed above is considered **experimental/investigational** because effectiveness has not been established.

Background

Articular cartilage is a highly resilient, viscoelastic material that plays an essential role in reducing stress on subchondral bone and minimizing friction within the joint. Articular cartilage is hyaline cartilage, which consists primarily of matrix, water and only a small number of chondrocytes (cartilage cells). Hyaline cartilage has a low capacity for regeneration because of its avascular and relatively acellular composition.

Osteochondral (OC) surfaces that are damaged by trauma or degenerative process usually fill in with fibrocartilage which is less suitable for absorbing stress than is hyaline cartilage. In younger adults, trauma is the most frequent cause of articular cartilage damage. Indications for OC repair include tears, chondral flaps, and loose bodies. All of these defects can result in joint pain, swelling, locking, and giving way.

Other causes of articular defects include degenerative conditions such as osteonecrosis, osteochondritis dissecans, and osteoarthritis. Osteonecrosis is the death of bone en masse and may arise spontaneously or can result from chronic steroid use. The etiology of this condition is uncertain, although it is thought to result from loss of the blood supply to an area of the subchondral bone. Osteoarthritis, or degenerative arthritis, is the most common form of arthritis in the United States and is characterized by the erosion of articular cartilage (NIAMS, 2001; Hangody et al., 2004; Koulalis et al., 2004).

ACI is a two-stage process in which, first, the healthy cartilage cells are harvested and cultured and then, reimplanted into the defect under a membranous patch at a later date. Allograft

transplant involves the transplant of a cadaveric graft consisting of viable articular cartilage and underlying subchondral bone to cover large (> 2 cm^2), full-thickness cartilage defects of the knee. Autograft procedures consist of removing small osteochondral cylinders from low weight-bearing surfaces of the affected joint or another joint in the same patient and inserting them into the affected area to create a mosaic of islands of hyaline cartilage in an area that would otherwise remain without cartilage or fill with only fibrocartilage.

Meniscal allograft transplantation is a surgical procedure that involves grafting a donor meniscus into the knee of a recipient. The goal of meniscal transplant surgery is to replace the meniscus cushion before the articular cartilage is damaged. The donor cartilage supports and stabilizes the knee joint, and therefore relieves knee pain.

Nonsurgical treatment options for damage to articular cartilage include weight reduction, physical therapy, braces and orthotics, intra-articular injection of hyaluronic acid derivatives, and non-steroidal anti-inflammatory agents. A realignment osteotomy (i.e., proximal tibial, distal femoral) is a surgical option to reduce the compressive stress on the damaged articular cartilage in the medial or lateral compartments of the knee. This can be performed instead of, or in addition to, a cartilage replacement procedure listed above. Total joint replacement provides a surgical option but is not advised for younger patients because implants might not withstand the higher levels of physical activity for an extended period of time. A 2003 National Institutes of Health (NIH) Consensus Conference advised that other options should be considered for patients under the age of 55 (Hand et al).[8]

The American Academy of Orthopaedic Surgeons (AAOS) believes that for appropriate patients musculoskeletal allografts represent a therapeutic alternative. These tissues should be acquired from facilities that demonstrate compliance, use well-accepted banking methodology, and follow Food and Drug Administration Good Tissue Practices. The AAOS urges all tissue banks to follow rigorous national guidelines and standards and recommends the use of tissue from banks that are accredited by the American Association of Tissue Banks.[3]

The AAOS has information on meniscal transplant surgery and notes that patient eligibility for this procedure includes missing more than half of a meniscus as a result of previous surgery or injury, or a meniscus tear that cannot be repaired.[3]

In summary, there have been a number of randomized controlled studies as well as non-comparative studies that have noted improvement in repairing articular cartilage that has been damaged by trauma or degenerative processes, through the procedures noted within this policy.

Coding Implications

This clinical policy references Current Procedural Terminology (CPT®). CPT® is a registered trademark of the American Medical Association. All CPT codes and descriptions are copyrighted 2020, American Medical Association. All rights reserved. CPT codes and CPT descriptions are from the current manuals and those included herein are not intended to be all-inclusive and are included for informational purposes only. Codes referenced in this clinical policy are for informational purposes only. Inclusion or exclusion of any codes does not guarantee coverage.

Providers should reference the most up-to-date sources of professional coding guidance prior to the submission of claims for reimbursement of covered services.

CPT® Codes	Description
27407	Repair, primary, torn ligament and or capsule of knee; cruciate
27412	Autologous chondrocyte implantation, knee
27415	Osteochondral allograft, knee, open
27416	Osteochondral autograft(s), knee, open (e.g., mosaicplasty) (includes harvesting of autograft[s])
28446	Open osteochondral autograft, talus (includes obtaining graft[s])
29866	Arthroscopy, knee, surgical; osteochondral autograft(s) (e.g. mosaicplasty) (includes harvesting of the autograft)
29867	Arthroscopy, knee, surgical; osteochondral allograft (eg, mosaicplasty)
29868	Arthroscopy, knee, surgical; meniscal transplantation (includes arthrotomy for meniscal), medial or lateral

HCPCS Codes	Description
J7330	Autologous cultured chondrocytes, implant
S2112	Arthroscopy, knee, surgical, for harvesting of cartilage (chondrocyte cells

ICD-10-CM Diagnosis Codes that Support Medical Necessity

ICD-10-CM Code	Description
M17.0- M17.9	Osteoarthritis of knee
M25.561-M25.569	Pain in knee
M25.861-M25.869	Other specified joint disorders, knee
M93.261- M93.269	Osteochondritis dissecans of knee
M94.9	Disorder of cartilage, unspecified
S83.30X (A,D,S)-S83.31X(A,D,S)	Tear of articular cartilage of knee, current
S89.80X (A,D,S)-S89.82X (A,D,S)	Other specified injuries of lower leg

Reviews, Revisions, and Approvals	Date	Approval Date
Osteochondral implants: added requirement for "absent or minimal changes in surrounding articular cartilage."	05/18	
In I.A., changed criteria to state age 18-55, or documented skeletal maturity if <18, instead of age 15-55, or documented skeletal maturity if < 18.	09/18	10/18
References reviewed and updated. Specialist reviewed.	10/2020	12/2021
Annual review. References reviewed and updated. Specialist reviewed.	7/27/2021	9/10/2021

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