Effective Date **1/15/2024**
Next Review Date… **1/15/2025**
Coverage Policy Number **IP0322**

Intraarticular Hyaluronic Acid Derivatives

Table of Contents

Related Coverage Resources

INSTRUCTIONS FOR USE
The following Coverage Policy applies to health benefit plans administered by Cigna Companies. Certain Cigna Companies and/or lines of business only provide utilization review services to clients and do not make coverage determinations. References to standard benefit plan language and coverage determinations do not apply to those clients. Coverage Policies are intended to provide guidance in interpreting certain standard benefit plans administered by Cigna Companies. Please note, the terms of a customer's particular benefit plan document [Group Service Agreement, Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a customer's benefit plan document always supersedes the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. In certain markets, delegated vendor guidelines may be used to support medical necessity and other coverage determinations.

Overview

This policy supports medical necessity review for the following Intraarticular Hyaluronic Acid products:

- **Durolane**® (hyaluronic acid)
- **Euflexxa**® (1% sodium hyaluronate)
- **Gel-One**® (cross-linked hyaluronate)
- **Gelsyn-3**™ (high molecular weight hyaluronan)
- **GenVisc 850**® (high molecular weight hyaluronan)
- **Hyalgan**® (sodium hyaluronate)
- **Hymovis**® (high molecular weight hyaluronan)
- **Monovisc**™ (high molecular weight hyaluronan)
- **Orthovisc**® (high molecular weight hyaluronan)
- **sodium hyaluronate 1% injection**
- **Supartz FX**™ (sodium hyaluronate)
- **Synojoynt** (sodium hyaluronate)
- **Synvisc**® (hylan G-F 20)

- **Synvisc-One®** (hylan G-F 20)
- **Triluron™** (sodium hyaluronate)
- **Trivisc** (sodium hyaluronate)
- **Visco-3™** (sodium hyaluronate)

Click here for information on the hyaluronic acid source of each product

Additional criteria that support the review for medical necessity exceptions of non-covered products are located in the Non-Covered Product Table by the respective plan type and drug list where applicable.

Receipt of sample product does not satisfy any criteria requirements for coverage.

Medical Necessity Criteria

Intraarticular Hyaluronic Acid products (Durolane, Euflexxa, Gel-One, Gelsyn-3, GenVisc 850, Hyalgan, Hymovis, Monovisc, Orthovisc, sodium hyaluronate 1% injection, Supartz FX, Synojoynt, Synvisc, Synvisc-One, Triluron, Trivisc, Visco-3) are considered medically necessary when the following are met:

Osteoarthritis of the Knee. Individual meets **ALL** of the following criteria:

A. Diagnosis of the knee to be treated is documented by radiologic evidence of osteoarthritis of the knee (for example, joint space narrowing, subchondral sclerosis, osteophytes, sub-chondral cysts)
B. Documentation of **ONE** of the following:
    i. Failure of **TWO** of the following modalities of therapy for osteoarthritis:
        1. At least six weeks of provider-directed conservative management program consisting of physical therapy or home exercises.
        2. At least **TWO** of the following pharmacologic therapies:
            a. Oral or topical nonsteroidal anti-inflammatory drug(s) [NSAID(s)]
            b. Acetaminophen
            c. Tramadol
            d. Duloxetine
        3. At least **ONE** injection of intraarticular corticosteroids to the affected knee
    ii. Documented contraindication or intolerance to **ALL** of the following modalities of therapy for osteoarthritis:
        1. Provider-directed conservative management program consisting of physical therapy or home exercises
        2. Pharmacologic therapies for knee osteoarthritis
        3. Intraarticular corticosteroids
C. Non-Covered Product Criteria is met, refer to below table(s)

Dosing. ONE of the following dosing regimens:[1-16, 43]
Note: Dose listed is for one knee. If two knees are being treated, then each knee requires a syringe or vial of product.

1. Durolane, Gel-One, Monovisc, Synvisc-One: One injection.
2. Hymovis: Up to two injections given 1 week apart.
3. Euflexxa, Gelsyn-3, sodium hyaluronate 1% injection, SynoJoynt, Synvisc, Triluron, TriVisc, Visco-3: Up to three injections given 1 week apart.
4. Orthovisc: Up to 4 injections given 1 week apart.
5. GenVisc 850, Hyalgan, Supartz FX: Up to 5 injections given 1 week apart.

Employer Group and Individual and Family Plan Non-Covered Products and Criteria:

Non-Covered Product	Criteria
Gel-One	There is documentation of **ONE** of the following:

Non-Covered Product	Criteria
(cross-linked hyaluronate)	1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
GenVisc 850 (high molecular weight hyaluronan)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Hyalgan (sodium hyaluronate)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc

Non-Covered Product	Criteria
	850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Hymovis (high molecular weight hyaluronan)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Monovisc (high molecular weight hyaluronan)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.

Non-Covered Product	Criteria
Orthovisc (high molecular weight hyaluronan)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Supartz FX (sodium hyaluronate)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Synojoynt (sodium hyaluronate)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following:

Non-Covered Product	Criteria
	A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Synvisc (hylan G-F 20)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Synvisc-One (hylan G-F 20)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid

Non-Covered Product	Criteria
	derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Triluron (sodium hyaluronate)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Trivisc (sodium hyaluronate)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization] B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.
Visco-3 (sodium hyaluronate)	There is documentation of **ONE** of the following: 1. Failure, contraindication, or intolerance to **BOTH** of the following: A. Euflexxa (1% sodium hyaluronate) [may require prior authorization]

Non-Covered Product	Criteria
	B. Durolane (hyaluronic acid) **OR** Gelsyn-3 (high molecular weight hyaluronan) [may require prior authorization] 2. Both of the following: A. The request is for product that requires more than one injection to complete a course (for example, GenVisc 850, Hyalgan, Hymovis, Supartz FX, Sodium hyaluronate injection, Triluron, TriVisc, Visco-3) B. A course of injections has already been started with one of these agents In these cases, the individual can continue with the same product to complete the entire course. After completing this course, if further therapy is required with a hyaluronic acid derivative, then a Preferred Product (Durolane, Euflexxa or Gelsyn-3) must be tried.

When coverage is available and medically necessary, the dosage, frequency, duration of therapy, and site of care should be reasonable, clinically appropriate, and supported by evidence-based literature and adjusted based upon severity, alternative available treatments, and previous response to therapy.

Reauthorization Criteria

Continuation of Intraarticular Hyaluronic Acid products is considered medically necessary for Osteoarthritis of the Knee when **ALL** of the following are met:

1. The above medical necessity criteria have been met prior to the start of Intraarticular Hyaluronic Acid therapy
2. There is documentation of beneficial response since initiating Intraarticular Hyaluronic Acid therapy
3. At least 6 months have lapsed since the completion of the prior treatment course

Authorization Duration

Initial approval duration is up to 6 months.
Reauthorization approval duration is up to 6 months.

Conditions Not Covered

Any other use is considered experimental, investigational or unproven including the following (this list may not be all inclusive):

1. **Acute Ankle Sprain.** A randomized, controlled, prospective trial was conducted which assessed the use of intraarticular hyaluronic acid in acute ankle sprains.[20-21] Patients treated with intraarticular hyaluronic acid (n = 79) within 48 hours of injury and again on Day 4 reported a time to pain-free and disability-free return to sport of 11 days (± 8 days) compared with 17 days (± 8 days) for placebo ($P < 0.05$).[18] All patients were also treated with standard of care (rest, ice, compression, and elevation). At 24 months, the placebo group experienced an increase in repeat sprains when compared with those treated with an intraarticular hyaluronic acid product (21 recurrent ankle sprains in the placebo group compared with 7 recurrent ankle sprains in the intraarticular hyaluronic acid treatment group [$P < 0.001$]) as well as a significant difference in missed days from participation in sport activity (49 days vs. 12 days for the placebo and hyaluronic acid groups, respectively; $P < 0.001$).[21] More data are needed to determine the role of intraarticular hyaluronic acid products in the treatment of acute ankle sprains.

2. **Osteoarthritis and Other Pathologic Conditions Involving Joints Other than the Knee** (e.g., hand, hip, ankle, shoulder osteoarthritis, temporomandibular joint [TMJ], adhesive capsulitis of the shoulder, subacromial impingement). The prescribing information for these agents state in the precautions section that the safety and effectiveness of hyaluronic acid derivatives injections into joints other than the knee have not been established.[1-16] Due to the absence of evidence to support use of intraarticular hyaluronic acid and potential for harm, the guidelines for the management of hand, hip, and knee osteoarthritis by American College of Rheumatology (2019) do not recommend use of intraarticular hyaluronic acid in patients with hand or hip osteoarthritis.[17] Small trials have also investigated intraarticular hyaluronic acid in other joints, including ankle osteoarthritis and hip osteoarthritis.[23-38] More data are needed to determine if there is a role for intraarticular hyaluronic acid for the treatment of osteoarthritis involving other joints. A small trial (n = 70) found that intraarticular hyaluronic acid did not result in increased benefit for adhesive capsulitis of the shoulder (also known as frozen shoulder) in patients who were already receiving physical therapy.[39] Another small study (n = 159) did not show benefit of intraarticular hyaluronic acid over corticosteroid or placebo injections in patients with subacromial impingement.[40]

3. **Pathologic Conditions of the Knee Other than Osteoarthritis** (e.g., chondromalacia patellae, osteochondritis dissecans, patellofemoral syndrome, post-anterior cruciate ligament [ACL] reconstruction). Intraarticular hyaluronic acid derivatives are indicated in knee osteoarthritis.[1-16] Adequate, well-designed trials have not clearly established the use of these products in other conditions of the knee.[41-42]

4. **The combination of any other product, (for example, platelet rich plasma (PRP), stem cell products, amniotic products, corticosteroids) with a viscosupplement injection.** There is insufficient evidence in the peer-reviewed published scientific literature to support safety and efficacy of the injection of platelet rich plasma (PRP) and/or corticosteroid into the same joint on the same date of service as a viscosupplement.[43]

Coding Information

1) This list of codes may not be all-inclusive.
2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

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

HCPCS Codes	Description
J7320	Hyaluronan or derivative, GenVisc 850, for intra-articular injection, 1 mg
J7321	Hyaluronan or derivative, Hyalgan, Supartz or Visco-3, for intra-articular injection, per dose
J7322	Hyaluronan or derivative, Hymovis, for intra-articular injection, 1 mg
J7324	Hyaluronan or derivative, Orthovisc, for intra-articular injection, per dose
J7325	Hyaluronan or derivative, Synvisc or Synvisc-One, for intra-articular injection, 1 mg
J7326	Hyaluronan or derivative, Gel-One, for intra-articular injection, per dose
J7327	Hyaluronan or derivative, Monovisc, for intra-articular injection, per dose
J7331	Hyaluronan or derivative, Synojoynt, for intra-articular injection, 1 mg
J7332	Hyaluronan or derivative, Triluron, for intra-articular injection, 1 mg

Background

OVERVIEW

Hyaluronic acid derivatives are indicated for the treatment of **pain related to knee osteoarthritis** in patients who have failed to respond adequately to conservative nonpharmacologic therapy and to simple analgesics (e.g., acetaminophen).[1-16,43] The use of intraarticular injections are to restore the normal properties (viscosity and elasticity) of the synovial fluid. Gel-One, Hyalgan, Supartz FX, Synvisc/Synvisc-One, Triluron, and Visco-3 are

derived from rooster or chicken combs. The remaining products are derived from non-avian sources and may be useful for patients with allergies to eggs or poultry products. GenVisc 850 has data to support similarity to Supartz FX.[9] Although retreatment data are limited, all of these products have data concerning efficacy and/or safety of repeat courses. In many cases, at least 6 months was required or a minimum of 6 months had elapsed prior to injection of a repeat course.

Guidelines

Guidelines for the medical management of osteoarthritis of the hand, hip, and knee are available from the American College of Rheumatology (2019).[17] Multiple non-pharmacological modalities are recommended for knee osteoarthritis, including exercise, self-management programs, weight loss, Tai Chi, and use of assistive devices (i.e., bracing or a cane). Pharmacologic therapy for knee osteoarthritis consists of acetaminophen, oral and topical non-steroidal anti-inflammatory drugs (NSAIDs), tramadol, intraarticular corticosteroid injections, duloxetine, and topical capsaicin. There is limited evidence establishing a benefit of hyaluronic acid intraarticular injections, which contributes to the conditional recommendation against use in knee osteoarthritis. However, when other alternatives have been exhausted or have failed to provide satisfactory benefit, use of intraarticular hyaluronic acid injections may be viewed more favorably than offering no intervention. In the guidelines, no distinction is made between the available intraarticular hyaluronic acid products or between products with various molecular weights.

The Osteoarthritis Research Society International also has guidelines for knee osteoarthritis (2019).[19] These guidelines note that use of intraarticular hyaluronic acid injections are conditionally recommended for patients with knee osteoarthritis. The guidelines comment on the long-term treatment effect with intraarticular hyaluronic acid injections which is associated with symptom improvement beyond 12 weeks and a more favorable safety profile than intraarticular corticosteroid injections.

Product	Hyaluronic Acid Source
Durolane (hyaluronic acid)	Bacteria cells
Euflexxa (1% sodium hyaluronate)	Bacterial cells
Gel-One (cross-linked hyaluronate)	Avian (chicken combs)
Gelsyn-3 (high molecular weight hyaluronan)	Bacterial fermentation
GenVisc 850 (high molecular weight hyaluronan)	Bacterial fermentation
Hyalgan (sodium hyaluronate)	Avian (rooster combs)
Hymovis (high molecular weight hyaluronan)	Bacterial fermentation
Monovisc (high molecular weight hyaluronan)	Bacterial cells
Orthovisc (high molecular weight hyaluronan)	Bacterial cells
Supartz FX (sodium hyaluronate)	Avian (chicken combs)
Synojoynt (sodium hyaluronate)	Bacterial fermentation
Synvisc (hylan G-F 20)	Avian (chicken combs)
Synvisc-One (hylan G-F 20)	Avian (chicken combs)
Triluron (sodium hyaluronate)	Avian (rooster combs)
Trivisc (sodium hyaluronate)	Bacterial fermentation
Visco-3 (sodium hyaluronate)	Avian (chicken combs)

References

1. Durolane® intraarticular injection [prescribing information]. Durham, NC: Bioventus; not dated.
2. Euflexxa® intraarticular injection [prescribing information]. Parsippany, NJ: Ferring; July 2016.
3. Gel-One® intraarticular injection [prescribing information]. Warsaw, IN: Zimmer; May 2011.
4. Gelsyn-3® intraarticular injection [prescribing information]. Durham, NC: Bioventus; 2016.
5. GenVisc® 850 intraarticular injection [prescribing information]. Doylestown, PA: OrthogenRx; not dated.
6. Hyalgan® intraarticular injection [prescribing information]. Parsippany, NJ: Fidia Pharma; May 2014.
7. Hymovis® intraarticular injection [prescribing information]. Parsippany, NJ: Fidia Pharma; October 2015.
8. Monovisc® intraarticular injection [prescribing information]. Bedford, MA: Anika; not dated.
9. Orthovisc® intraarticular injection [prescribing information]. Bedford, MA: Anika; September 2014.

10. Sodium hyaluronate 1% intraarticular injection [prescribing information]. North Wales, PA: Teva; March 2019.
11. Supartz® FX™ intraarticular injection [prescribing information]. Durham, NC: Bioventus; April 2015.
12. Synvisc® intraarticular injection [prescribing information]. Ridgefield, NJ: Genzyme; September 2014.
13. Synvisc-One® intraarticular injection [prescribing information]. Ridgefield, NJ: Genzyme; September 2014.
14. Triluron intraarticular injection [prescribing information]. Florham Park, NJ: Fidia Pharma; March 2019.
15. Trivisc intraarticular injection [prescribing information]. Doylestown, PA: OrthogenRx; not dated.
16. Visco-3 intraarticular injection [prescribing information]. Durhan, NC: Bioventus; not dated.
17. Kolasinski SH, Neogi T, Hochberg MC, et al. 2019 American College of Rheumatology/Arthritis Foundation Guideline for the management of osteoarthritis of the hand, hip, and knee. *Arthritis Care Res.* 2019;72(2):149-162.
18. American Academy of Orthopaedic Surgeons Management of Osteoarthritis of the Knee (Non-Arthroplasty) Evidence-Based Clinical Practice Guideline. Published August 31, 2021. Available at: Osteoarthritis of the Knee - Clinical Practice Guideline (CPG) | American Academy of Orthopaedic Surgeons (aaos.org). Accessed on September 21, 2023.
19. Bannuru RR, Osani MC, Vaysbrot EE, et al. OARSI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis. *Osteoarthritis Cartilage*. 2019;27(11):1578-1589.
20. Petrella RJ, Petrella MJ, Cogliano A. Periarticular hyaluronic acid in acute ankle sprain. *Clin J Sport Med*. 2007;17(4):251-257.
21. Petrella MJ, Cogliano A, Petrella RJ. Original research: long-term efficacy and safety of periarticular hyaluronic acid in acute ankle sprain. *Phys Sportsmed*. 2009;37(1):64-70.
22. Izquierdo R, Voloshin I, Edwards S, et al. Treatment of glenohumeral osteoarthritis. *J Am Acad Orthop Surg*. 2010;18(6):375-382.
23. Sun SF, Chou YJ, Hsu CW, et al. Efficacy of intra-articular hyaluronic acid in patients with osteoarthritis of the ankle: a prospective study. *Osteoarthritis Cartilage*. 2006;14(9):867-874.
24. Salk RS, Chang TJ, D'Costa WF, et al. Sodium hyaluronate in the treatment of osteoarthritis of the ankle: a controlled, randomized, double-blind, pilot study. *J Bone Joint Surg Am*. 2006;88(2):295-302.
25. Karatosun V, Unver B, Ozden A, et al. Intra-articular hyaluronic acid compared to exercise therapy in osteoarthritis of the ankle. A prospective randomized trial with long-term follow-up. *Clin Exp Rheumatol*. 2008;26(2):288-294.
26. Sun SF, Chou YJ, Hsu CW, Chen WL. Hyaluronic acid as a treatment for ankle osteoarthritis. *Curr Rev Musculoskelet Med*. 2009;2(2):78-82.
27. Cohen MM, Altman RD, Hollstrom R, et al. Safety and efficacy of intra-articular sodium hyaluronate (Hyalgan) in a randomized, double-blind study for osteoarthritis of the ankle. *Foot Ankle Int*. 2008;29(7):657-663.
28. Abate M, Pulcini D, Di Iorio A, Schiavone C. Viscosupplementation with intra-articular hyaluronic acid for treatment of osteoarthritis in the elderly. *Curr Pharm Des*. 2010;16(6):631-640.
29. DeGroot H 3rd, Uzunishvili S, Weir R, et al. Intra-articular injection of hyaluronic acid is not superior to saline solution injection for ankle arthritis: a randomized, double-blind, placebo-controlled study. *J Bone Joint Surg Am*. 2012;94(1):2-8.
30. Sun SF, Hsu CW, Sun HP, et al. The effect of three weekly intra-articular injections of hyaluronate on pain, function, and balance in patients with unilateral ankle arthritis. *J Bone Joint Surg Am*. 2011;93(18):1720-1726.
31. Tikiz C, Unlu Z, Sener A, et al. Comparison of the efficacy of lower and higher molecular weight viscosupplementation in the treatment of hip osteoarthritis. *Clin Rheumatol*. 2005;24:244-250.
32. Migliore A, Tormenta S, Severino L, et al. The symptomatic effects of intra-articular administration of hylan G-F 20 on osteoarthritis of the hip: clinical data of 6 months follow-up. *Clin Rheumatol*. 2006;25(3):389-393.
33. Qvistgaard E, Christensen R, Torp-Pedersen S, Bliddal H. Intra-articular treatment of hip osteoarthritis: a randomized trial of hyaluronic acid, corticosteroid, and isotonic saline. *Osteoarthritis Cartilage*. 2006;14(2):163-170.
34. Caglar-Yagci H, Unsal S, Yagci I, et al. Safety and efficacy of ultra-sound guided intra-articular hylan G-F 20 injection in osteoarthritis of the hip: a pilot study. *Rheumatol Int*. 2005;25(5):341-344.
35. Conrozier T, Vignon E. Is there evidence to support the inclusion of viscosupplementation in the treatment paradigm for patients with hip osteoarthritis? *Clin Exp Rheumatol*. 2005;23(5):711-716.

36. Van Den Bekerom MPJ. Viscosupplementation in symptomatic severe hip osteoarthritis: a review of the literature and report on 60 patients. *Acta Orthop Belg*. 2006;72:560-568.
37. Fernandez Lopez JC, Ruano-Ravina A. Efficacy and safety of intraarticular hyaluronic acid in the treatment of hip osteoarthritis: a systematic review. *Osteoarthritis Cartilage*. 2006;14(12):1306-1311.
38. Richette P, Ravaud P, Conrozier T, et al. Effect of hyaluronic acid in symptomatic hip osteoarthritis: a multicenter, randomized, placebo-controlled trial. *Arthritis Rheum*. 2009;60(3):824-830.
39. Hsieh LF, Hsu WC, Lin YJ, et al. Addition of intra-articular hyaluronate injection to physical therapy program produces no extra benefits in patients with adhesive capsulitis of the shoulder: a randomized controlled trial. *Arch Phys Med Rehabil*. 2012;93(6):957-964.
40. Penning LI, de Bie RA, Walenkamp GH. The effectiveness of injections of hyaluronic acid or corticosteroid in patients with subacromial impingement: a three-arm randomised controlled trial. *J Bone Joint Surg Br*. 2012;94(9):1246-1252.
41. Tang X, Pei FX, Zhou ZK, et al. A randomized, single-blind comparison of the efficacy and tolerability of hyaluronate acid and meloxicam in adult patients with Kashin-Beck disease of the knee. *Clin Rheumatol*. 2012;31(7):1079-1086.
42. Chau JY, Chan WL, Woo SB, et al. Hyaluronic acid instillation following arthroscopic anterior cruciate ligament reconstruction: a double-blinded, randomised controlled study. *J Orthop Surg (Hong Kong)*. 2012;20(2):162-165.
43. SynoJoynt™ injection [prescribing information]. Naples, FL: Arthrex; 2022.