Injectable clostridial collagenase for the treatment of Dupuytren contracture in adult patients with a palpable cord may be considered medically necessary, for up to three injections at intervals of at least thirty days (see the Policy Guidelines section).

Injectable clostridial collagenase is considered investigational for all other indications including, but not limited to:
- Adhesive capsulitis
- Cellulite
- Flexor tendon adhesions of the hand
- Peyronie disease

**Policy Guidelines**

**Multiple Injections**
For patients with Dupuytren contracture, physicians should treat no more than two joints per hand per treatment visit (this is consistent with U.S. Food and Drug Administration labeling).

**Coding**
There is a HCPCS code specific to this drug:
- J0775: Injection, collagenase, clostridium histolyticum, 0.01 mg

The following CPT codes are specific for the treatment for Dupuytren contracture:
- 20527: Injection, enzyme (e.g., collagenase), palmar fascial cord (i.e., Dupuytren's contracture)
- 26341: Manipulation, palmar fascial cord (i.e., Dupuytren's cord), post enzyme injection (e.g., collagenase), single cord

CPT instructs that the custom orthotic fabrication/application would be coded separately.

Prior to 2012, there was no specific CPT code for this injection. The injection was likely reported with CPT code 20550 – injection(s); single tendon sheath, or ligament, aponeurosis (e.g., plantar “fascia”). This code might also be used for this treatment in adhesive capsulitis.

For the use of this treatment for Peyronie disease, the American Urological Association (http://www.auanet.org/guidelines/peyronies-disease-(2015)) has recommended use of the following CPT codes:
- 54200: Injection procedure for Peyronie disease
- 54235: Injection of corpora cavernosa with pharmacologic agent(s) (e.g., papaverine, phentolamine). This part of the service is to induce an erection so that the location of the clostridial collagenase injection can be determined.
- 96372: Therapeutic, prophylactic, or diagnostic injection (specify substance or drug); subcutaneous or intramuscular. If the penis does not detumesce, this code might also be reported for administration of a medication to pharmacologically detumesce the penis.

**Description**

Clostridial collagenase is a bacterial collagenase, derived from Clostridium histolyticum, which has been evaluated for the treatment of fibroproliferative disorders such as Dupuytren contracture, Peyronie disease, and adhesive capsulitis.
Related Policies

- N/A

Benefit Application

Benefit determinations should be based in all cases on the applicable contract language. To the extent there are any conflicts between these guidelines and the contract language, the contract language will control. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

Some state or federal mandates [e.g., Federal Employee Program (FEP)] prohibits plans from denying Food and Drug Administration (FDA)-approved technologies as investigational. In these instances, plans may have to consider the coverage eligibility of FDA-approved technologies on the basis of medical necessity alone.

Regulatory Status

Table 1 lists indications for clostridial collagenase (Xiaflex®; Auxilium Pharmaceuticals [Norristown, PA]) that have been approved by the Food and Drug Administration.

Table 1. FDA-Approval History for Clostridial Collagenase (Xiaflex®)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Approved</th>
<th>Initial Indication</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dupuytren contracture</td>
<td>2010</td>
<td>Adults with Dupuytren contracture with a palpable cord&lt;br&gt;Up to 3 injections at 4-wk intervals into a palpable Dupuytren cord with a contracture of a metacarpophalangeal or a proximal interphalangeal joint</td>
<td>Approval accompanied by REMS&lt;br&gt;The manufacturer must:&lt;br&gt;o Evaluate and mitigate risks and serious adverse events&lt;br&gt;o Instruct health care providers on procedure to inject Xiaflex and perform finger extension procedures&lt;br&gt;o Inform patients of potential risks of treatment&lt;br&gt;In 2014, indication expanded: up to 2 joints in same hand may be treated during a treatment visit</td>
</tr>
<tr>
<td>Peyronie disease</td>
<td>2013</td>
<td>Men with a palpable penile plaque and penile curvature &gt;30°&lt;br&gt;A maximum of 4 cycles, each of which consists of 2 Xiaflex injection procedures</td>
<td>Approval accompanied by black box warning of corporal rupture&lt;br&gt;Only available through a restricted program, Xiaflex REMS, due to risk of corporal rupture. REMS requirements:&lt;br&gt;o Prescribers must enroll and complete training in administration of Xiaflex for treatment of Peyronie disease&lt;br&gt;o Health care sites must be certified with the program and ensure that only certified prescribers administer Xiaflex</td>
</tr>
</tbody>
</table>

Adapted from Food and Drug Administration (2017).³
FDA: Food and Drug Administration; REMS: Risk Evaluation and Mitigation Strategy.
Rationale

Background
Fibroproliferative Disorders
Fibrotic tissue disorders, characterized by excessive collagen deposits, can affect the musculoskeletal system, causing pain and limiting movement and reducing joint range of motion. Examples of fibroproliferative disorders include Dupuytren disease, Peyronie disease, and adhesive capsulitis. The mechanisms that contribute to the pathology are poorly understood.

Dupuytren Disease
In Dupuytren disease, collagen deposition in nodules and cords in the palm and fingers results in pitting of the overlying cutis and flexion contractures. The mechanisms that contribute to the pathology are poorly understood. The prevalence of Dupuytren disease is estimated at 3% to 6% in the general population and increases with advancing age. The disease is more common in people with diabetes or thyroid disease and among men. The standard of care for Dupuytren disease is surgery, most commonly open fasciectomy. Other surgical procedures are percutaneous fasciotomy and needle fasciotomy. Surgery is recommended in patients with functional impairment and metacarpophalangeal joint contractures of 30° or more. There is no effective pharmacotherapy.

Peyronie Disease
Peyronie disease is the development of abnormal scar tissue, or plaques, in the tunica albuginea layer of the penis causing distortion, curvature, and pain (usually during erection). It occurs in 3% to 9% of men, most commonly between the ages of 45 and 60 years. In some cases, plaque does not cause severe pain or curvature, and the condition resolves on its own. In severe cases, erectile dysfunction can occur. The goal of treatment is to reduce pain and maintain sexual function. Treatments in early stages (before calcification) include vitamin E or para-aminobenzoate tablets (e.g., Potaba), although studies of oral therapies have demonstrated inconsistent benefit. Intralesional injection therapy consisting of injection of interferon-α-2b or calcium channel-blockers (e.g., verapamil) is the current standard of therapy. Surgical procedures involve the excision of hardened tissue and skin graft, the removal or pinching (plication) of tissue opposite the plaque to reduce curvature (the Nesbit procedure), penile implant, or a combination of these.

Adhesive Capsulitis
Adhesive capsulitis or “frozen shoulder” is treated with physical therapy and mobilization in combination with analgesics or nonsteroidal anti-inflammatory drugs. Corticosteroid injection is used with caution. The prevalence of adhesive capsulitis is estimated at 2% to 3% in the general population and increases with advancing age; additionally, adhesive capsulitis is more common in people with diabetes or thyroid disease and among women.

Treatment
Injection with clostridial collagenase is intended to provide a nonoperative treatment option for fibroproliferative disorders. Clostridial collagenase histolyticum is an enzyme produced by the bacterium Clostridium histolyticum, which has the physiologic effect of breaking down collagen. It has been developed and marketed pharmacologically as a treatment for disorders associated with collagen overdevelopment.

Literature Review
Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function—including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is balance of benefits and harms.
To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice. The following is a summary of the key findings to date.

**Dupuytren Disease (Dupuytren Contracture)**

**Systematic Reviews**

In 2016, Smeraglia et al reported results of a systematic review of studies assessing on clostridial collagenase injections for Dupuytren contracture. Reviews included 43 studies (total N=6795 patients) published from 2000 to 2015, with some overlap across studies in terms of patient populations. Mean follow-up was 15 months (range, 1-96 months). Eighteen studies reported on primary outcomes of clinical satisfaction of patients and residual contracture of less than 5°, and 9 studies reported on patient satisfaction. Reviewers noted that longer term follow-up studies were necessary given the increase in contracture recurrence and that most studies lacked patient-related outcomes.

In 2015, Brazzelli et al reported on a health technology assessment that included a systematic review and economic evaluation of clostridial collagenase use for the treatment of Dupuytren contracture. Reviews included 8 RCTs, 7 nonrandomized comparative studies, and 15 observational studies (total N=7657 patients) involving collagenase and/or surgical interventions in patients with a palpable Dupuytren cord. No head-to-head RCTs comparing clostridial collagenase with surgery were identified by meta-analysis. Of the 5 RCTs comparing collagenase with placebo, three were included in a meta-analysis. In pooled analysis, the proportion of all first, first metacarpophalangeal, first proximal interphalangeal joints achieving clinical success favored clostridial collagenase (relative risk [RR], 10.21; 95% confidence interval [CI], 5.29 to 19.69; P=0%; RR=10.27; 95% CI, 4.88 to 21.65; P=0%; RR=6.90; 95% CI, 4.28 to 11.12; P=0%, respectively). However, rates of local adverse events were higher in clostridial collagenase-treated patients.

Chen et al published a systematic review in 2011 of various treatments for Dupuytren contracture. Studies published through December 2010 were examined and included 4 prospective studies (including 2 randomized studies) on collagenase injections, 6 studies on open partial fasciectomy (including 2 randomized studies), and 3 studies on needle aponeurotomy. Sample sizes ranged from 13 to 261 patients. Reviewers found recurrence rates for collagenase injections (mean follow-up, 120 days to 4 years) ranged from 10% to 31%. Needle aponeurotomy had the highest recurrence rates (50%-58% mean follow-up, 3-5 years), which were significantly higher than the open partial fasciectomy recurrence rates (12%-39% mean follow-up, 1.5-7.3 years). Additionally, open partial fasciectomy recurrence rates were significantly higher than collagenase injection. Complications occurred most often with open partial fasciectomy, although 2 cord ruptures were reported with collagenase injection. Reviewers concluded that further studies were needed to understand the long-term outcomes of these interventions and how to address contracture recurrence. It was also noted that it is unclear whether collagenase injection can be used for Dupuytren revision.

In 2015, Peimer et al summarized the safety and tolerability of clostridial collagenase or surgical treatment (fasciectomy) for Dupuytren contracture. The safety of clostridial collagenase was based on 11 clinical trials (n=1082 patients), while the safety of fasciectomy was based on 48
European studies (n=7727 patients). Compared with rates reported after fasciectomy, clostridial collagenase–treated patients had lower rates of nerve injury (median, 0% vs 3.8%), neurapraxia (4.4% vs 9.4%), complex regional pain syndrome (0.1% vs 4.5%), and arterial injury (0% vs 5.5%), but higher reported rates of tendon injury (0.3% vs 0.1%), skin injury (16.2% vs 2.8%), and hematoma (77.75% vs 2%), all respectively. Pooled estimates and statistical comparisons were not reported.

**Randomized Controlled Trials**

Five publications from 3 unique double-blind, RCTs (including 2 follow-up RCT extension studies) were identified, all sponsored by Xiaflex manufacturer Auxilium Pharmaceuticals.

In 2009, Hurst et al published results from the Collagenase Option for Reduction of Dupuytren’s I (CORD I) study, a randomized, double-blind, placebo-controlled, multicenter trial (16 sites) of collagenase *Clostridium histolyticum* for Dupuytren contracture in 308 subjects with joint contractures of 20° or more. This trial was included in the Chen review previously described. Joints were stratified by type (MCP joints or PIP joint) and severity of contracture; they were randomized in a 2:1 ratio to receive up to 3 injections of either collagenase or placebo in the contracted collagen cord at 30-day intervals. Secondary and tertiary joints were identified for possible subsequent injections. Joints were manipulated 1 day after injection if necessary. The primary end point was reduction in contracture to 0° to 5° of full extension 30 days after the last injection. Secondary end points were also evaluated. Recurrence of contracture was defined as an increase in joint contracture of 20° or more and was considered an adverse event. Efficacy results were based on 306 primary joints: 203 injected with collagenase and 103 injected with a placebo. In the collagenase-treated group, 130 (64%) of 203 cords met the primary end point vs 7 (6.8%) of 103 placebo-injected cords (p<0.001). More than half of the collagenase-injected joints that did not meet the primary end point did not receive the maximum allowable number of injections, most commonly because a cord could not be palpated or the patient was satisfied with the result. Median time to reach the primary end point for collagenase-treated joints was 56 days. At the 90-day visit, there was no recurrence of contracture in collagenase-treated primary joints that had reached the primary end point.

When analyzed by joint type, more collagenase-treated joints achieved the primary end point than placebo (MCP joint, 76.7% vs 7.2%; PIP joint, 40.9% vs 5.9%, both respectively; p<0.001 for both comparisons). Mean change in contracture from baseline to 30 days after the last injection was 48.0° to 7.2° in the collagen-injected MCP joints and 45.4° to 43.1° in the placebo-injected MCP joints. Thirty days after the last injection, 84.7% of collagenase-injected joints vs 11.7% of placebo-injected joints showed clinical improvement. Results were better in MCP joints than in PIP joints for the collagenase group (94.0% vs 67.1%) than for the placebo group (11.6% vs 11.8%), respectively. Overall, 96.6% of patients who received collagenase reported at least 1 treatment-related adverse event. They had significantly more injection- and manipulation-related events, such as contusion, hemorrhage, injection-site pain, upper-extremity pain, and lymphadenopathy (p<0.02) than patients who received a placebo injection. Most were mild or moderate in intensity; however, 20 patients in the collagenase group and two in the placebo group reported severe events. Three severe adverse events were considered treatment-related (a case of complex regional pain syndrome, 2 tendon ruptures), and both required surgical procedures. The CORD I authors noted that trial timeframe was insufficient to assess recurrence. In 2011, Witthaut et al reported on range of motion (ROM) outcomes from the CORD I study. On day 30, mean ROM increased from 43.9° to 80.7° in joints treated with collagenase. In the joints treated with placebo, mean ROM increased 45.3° to 49.5° on day 30. Using regression models to create a ROM severity classification, the authors reported that joint treated with collagenase had a significant mean increase in ROM of 36.7° (p<0.001), whereas joints treated with placebo did not (4.0°).

In a letter to the editor in response to the publication of the trial, Holzer and Holzer commented that successful treatment of Dupuytren disease correlates with the percentage of excised Dupuytren tissue and the extent of the intervention. They cautioned that the value of
Collagenase injection must be confirmed in a long-term follow-up study that focuses on the recurrence rate.

In 2010, Gilpin et al published results of the CORD II study. In this study, 66 patients were randomized to collagenase injection (45 cords) or placebo (21 cords) in the 90-day, double-blind phase followed by an open-label phase of 9 months. The authors reported that, within 30 days, collagenase injections resulted in significantly more cord contracture improvement from baseline to within 0° to 5° of normal than placebo (44.4% vs 4.8%, respectively). Results after the open-label treatment were reported to be similar to the double-blind phase. Recurrence of contracture (defined as increase of contracture to ≥20°) did not occur during the 12-month follow-up. All study participants experienced mild adverse events (e.g., swelling and pain at injection site). Three serious adverse events related to treatment were reported. A flexion pulley rupture of the left small finger occurred in 1 patient while rapid thickening of the treated cord and sensory abnormalities occurred in another patient.

In 2014, McGrouther et al reported on results from a post hoc subgroup analysis of the randomized and open-label phases CORD I and II studies to evaluate the efficacy and safety of clostridial collagenase in the subgroup of 58 Dupuytren contracture patients (67 joints) with up to 2 joints affected and moderate disease, according to British Society of Surgery of the Hand classification. Of the subgroup, 82% met the primary end point of clinical success, defined as a reduction in contracture to within 5° of full extension 30 days after the last injection. Recurrence of the contracture (defined as an increase in joint contracture to ≥20° in the presence of a palpable cord in joints that had previously had clinical success) occurred in 3.8% of joints treated. Fifty-five (94.8%) patients developed treatment-related adverse events, all of which were considered mild (e.g., pain and swelling at the injection site).

In 2007, Badalamente and Hurst reported on patients who participated in a double-blind, phase 3 RCT comparing collagenase with placebo injections. During the double-blind and open-label phases, 62 joints (31 MCP, 31 PIP) were treated in 35 patients. Fifty-four (87%) were clinical successes. Twenty-seven joints were followed for 24 months. Over the 24 months after the last injection, 5 joints had recurrences (1 MCP, 4 PIP), one before 12 months, two at 12 months, and two at 24 months after treatment. Three of these patients underwent fasciectomy. The most common adverse events were local reactions to injections. Limited patient follow-up makes drawing conclusions difficult.

In 2014, Raven et al published a subgroup analysis of data pooled from the previously described 3 RCTs (CORD I, CORD II, Badalamente and Hurst) of collagenase treatment of Dupuytren-related contractures. This analysis included 271 patients with MCP (n=167) or PIP (n=104) joint contractures of 20° or more treated with collagenase injections (0.58 mg per injection). Subgroups included age, sex, and diabetes status. End points included the rate of clinical success (reduction in contracture to 0°-5° of normal) and the percentage of adverse events. There were no significant differences in clinical success by age, diabetes status, or sex, with 63% of cases reaching the end point. In addition, there were no differences in complication rates among subgroups, with peripheral edema, contusion, and injection-site hemorrhage being most common.

Nonrandomized Comparative Studies
Since the publication of the RCTs previously described, several smaller nonrandomized studies have compared clostridial collagenase with surgical procedures for the treatment of Dupuytren contracture.

Naam et al (2013) retrospectively compared patients who had Dupuytren contracture affecting at least 1 joint with a palpable cord who underwent clostridial collagenase injections (n=25) or fasciectomy (n=21). Some patients who received clostridial collagenase injections were enrolled in the JOINT1 study, described below. Over an average follow-up of 32 months for patients treated with clostridial collagenase and 39 months for those treated with fasciectomy,
mean posttreatment contracture, decrease in contracture from baseline, and increase in ROM from baseline at the MCP and PIP joints did not differ significantly. Mean posttreatment ROM at the MCP joint was significantly higher in the clostridial collagenase-treated patients (90.7° vs 83.3°, p = 0.02), while the posttreatment ROM at the PIP joint was higher in the fasciectomy-treated patients, although the difference was not statistically significant (67.5° vs 88.8°, p = 0.06). Complication rates were similar in both groups, although patients who received clostridial collagenase returned more quickly to work and to normal daily activities.

In a small study from a single U.K. center, Povlsen et al (2014) prospectively assessed outcomes for patients with single-digit Dupuytren contraction who underwent open fasciectomy (n = 10) or clostridial collagenase injection followed by manipulation (n = 10). Total active movement at the PIP joint and at the MCP and PIP joints combined were statistically better in the clostridial collagenase group (p = 0.01 and p < 0.025, respectively) in the short-term (i.e., days) after the procedure. Longer term follow-up was not reported.

Zhou et al (2015) compared outcomes for patients who underwent clostridial collagenase injection or limited fasciectomy for Dupuytren contracture at 7 sites in the Netherlands. A total of 218 subjects met inclusion criteria (104 treated with clostridial collagenase, 114 treated with limited fasciectomy). After propensity score matching, the final analysis group included 66 subjects with each treatment. At last follow-up 6 to 12 weeks postprocedure, the residual contracture for affected MCP joints did not differ significantly between groups (13° for clostridial collagenase vs 6° for limited fasciectomy, p = 0.095), while affected PIP joints had significantly worse residual contracture in the collagenase group (25° vs 15°, p = 0.010). Fewer adverse events occurred among clostridial collagenase–treated subjects.

**Noncomparative Studies**

Noncomparative studies are discussed to provide data on adverse event rates after clostridial collagenase injections. A number of single-arm studies have reported outcomes after clostridial collagenase injections for Dupuytren contracture, the largest of which were the JOINT I, JOINT II, and CORDLESS studies.

In 2013, Witthaut et al published the findings from 2 concurrent open-label, single-arm studies (JOINT I, JOINT II) designed to evaluate the efficacy and safety of collagenase injections (0.58 mg per injection), which were used to reduce the degree of contracture in patients with advanced Dupuytren contracture at 9 months of follow-up. The primary end point was clinical success, defined as a reduction in contracture to within 0° to 5° of full extension 30 days after the last injection. A secondary end point was clinical improvement, defined as 50% or more reduction from baseline contracture. Dupuytren cords affecting 879 joints (531 MCP, 348 PIP) in 587 patients were administered collagenase injections at 14 American (JOINT I) and 20 Australian/European (JOINT II) sites. Similar results were reported in both studies. Seventy-one percent (n = 625) of joints did not require a second injection, and 89% of joints did not require a third injection. Clinical success was achieved in 497 (57%) of treated joints using 1.2 collagenase injections per cord. More MCP than PIP joints achieved clinical success (70% and 37%, respectively) and clinical improvement (89% and 58%, respectively). For joints not achieving clinical success and not receiving the maximum 3 injections (128 MCP, 173 PIP joint), reasons included no palpable cord (MCP joint, 52% PIP joint, 44%), injections in other cords reached the protocol-specified per-patient maximum of 5 per patient (MCP joint, 19% PIP joint, 21%), and satisfaction with response (MCP joint, 8% PIP joint, 9%). When data from JOINT I and II were pooled to evaluate clinical success by contracture severity, the MCP and PIP joints with less contracture severity (i.e., ≤50° and ≤40°, respectively) showed better responses than more severely contracted joints. After 9 months of follow-up, 71% of patients were “very satisfied” and 21% “quite satisfied” with collagenase treatment, using a 5-point Likert-type scale. For physician ratings of improvement, 47% rated change from baseline as “very much improved,” and 35% as “much improved” using a 7-point scale.
The relatively short-term (9-month) follow-up in these 2 JOINT studies limits the ability to make conclusions on long-term outcomes, including the likelihood of recurrence. Patients who achieved clinical success in the 2 JOINT studies had the option to enroll in a 5-year follow-up study, which also included patients from the 2 CORD studies previously reviewed.

In 2013, Peimer et al published interim data after the third year of the above-mentioned 5-year follow-up study, Collagenase Option for Reduction of Dupuytren Long-Term Evaluation of Safety Study (CORDLESS). Of 1080 collagenase-treated joints, 623 (451 MCP, 172 PIP) had achieved 0° to 5° contracture in the original studies. Recurrence occurred in 35% of the successfully treated joints over the 3-year follow-up period. No long-term complications attributed to collagenase injections were reported during this follow-up period. Five-year follow-up from the CORDLESS registry were reported in 2015. Recurrence were reported in 47% (291/623) of successfully treated joints.

Badalamente et al (2015) published a pooled analysis of data from the CORD I and II trials (described in Randomized Controlled Trials section above) and the JOINT I and II trials reporting on outcomes for clostridial collagenase for PIP contractures. The pooled analysis included 644 PIP joints in 506 patients, of which 60% (384 joints), 24% (154 joints), and 16% (100 joints) were treated with 1, 2, and 3 injections, respectively. Clinical success (0°-5° of full extension) occurred in 27% of joints after 1 injection and in 34% after the last injection. Clinical improvement occurred in 49% of joints after 1 injection and in 58% after the last injection. Six treatment-related serious adverse events occurred, including 2 tendon ruptures and 1 case each of tendon injury, complex regional pain syndrome, finger deformity, and tendonitis.

In 2015, Gaston et al reported safety and efficacy outcomes of a phase 3b, open-label study of the concurrent administration of 2 clostridial collagenase injections into cords in the same hand to treat 2 joints with Dupuytren contractures. The study enrolled 715 patients with 725 joint pairs treated; 3 patients were lost to follow-up, 3 patients withdrew consent, and 1 patient did not have a postbaseline efficacy assessment. Seven hundred fourteen patients with 724 joint pairs were included in a modified intention-to-treat efficacy analysis. Joint pairs treated included MCP and PIP joints on the same finger, 2 MCP joints on different fingers, 2 PIP joints on different fingers, and 1 MCP and 1 PIP joint on different fingers in 48%, 34%, 10%, and 8% of subjects, respectively. The percent improvement in fixed flexion contracture was 72%, 84%, 60%, and 68% in patients who had treatment of the MCP/PIP joints (same finger), 2 MCP joints (different fingers), 2 PIP joints (different fingers), and MCP/PIP joints (different fingers), respectively. At least 1 treatment-related adverse event occurred in 95% of subjects, most of which were mild or moderate. Six patients had treatment-related or possibly treatment-related serious adverse events.

A number of other smaller single-arm studies have been published, with sample sizes ranging from 23 to 254 patients, and generally with shorter term follow-up (≈ 6 to 15 months). One study, by Watt et al (2010), reported on 23 patients, eight of whom had long-term follow-up to 8 years. Among those with isolated MCP contracture (n=6), four experienced recurrence by 8 years, while both patients with isolated PIP contracture experienced recurrence by 8 years.

**Section Summary: Dupuytren Contracture**

The most direct evidence related to the use of clostridial collagenase for Dupuytren contractures comes from several RCTs that compared clostridial collagenase with placebo injections, and generally showed high rates of contracture resolution. This evidence is supported by nonrandomized comparative studies comparing clostridial collagenase to surgery. Some studies have reported similar outcomes with faster return-to-work and return-to-usual activities rates with clostridial collagenase, but 1 study reported poorer contraction improvement but lower adverse event rates with clostridial collagenase. Rates of mild local adverse events, including local swelling, pain, and ecchymosis, are generally high. Serious adverse events associated with therapy can include tendon rupture/injury, regional pain syndrome, and finger deformity.
**Peyronie Disease**

**Systematic Reviews**

In 2015, Carson et al reported on a pooled analysis of 6 clinical studies to evaluate safety outcomes for clostridial collagenase for Peyronie disease. Studies included were phase 2 and 3 industry-sponsored trials of clostridial collagenase, which are included in the Randomized Controlled Trials section below. A total of 1044 patients were included in the pooled safety analysis, of whom 85.8% had a treatment-related adverse event, most of which (75.2%) were mild or moderate in severity. Approximately 1% (n=9) of patients had a treatment-related serious adverse event, including 5 cases of penile hematoma and 4 cases of corporal rupture.

In 2007, Russell et al conducted a systematic review of plaque injection therapy for Peyronie disease, which included 2 studies of collagenase. Both articles, an RCT and another rated as a lower level study (published in 1985 and 1993), reported positive treatment outcomes. However, more recent RCT evidence is available, and it provides more direct evidence on the efficacy of clostridial collagenase injections for Peyronie disease.

**Randomized Controlled Trials**

In 2013, Gelbard et al published the results of 2 double-blind, placebo-controlled randomized trials, IMPRESS (Investigation for Maximal Peyronie’s Reduction Efficacy and Safety Studies) I and II, which examined the clinical efficacy and safety of collagenase injections in subjects with Peyronie disease. These RCTs were sponsored by the manufacturer (Auxilium Pharmaceuticals), the findings of which were submitted to the Food and Drug Administration in support of their biologics license application. These 2 trials examined collagenase injections in 417 and 415 participants, respectively, through a maximum of 4 treatment cycles, each separated by 6 weeks (for up to 8 injections of collagenase 0.58 mg). Men were stratified by baseline penile curvature (30° to 60° vs 61° to 90°) and randomized to collagenase injections or placebo in a 2:1 ratio. The primary outcomes were the percent change in the penile curvature abnormality, as well as the change in the Peyronie’s Disease Questionnaire (PDQ; developed by the manufacturer; see discussion at the end of this section on PDQ validation) symptoms bother score from baseline to 52 weeks. Data from the IMPRESS I and II studies were pooled. Participants treated with collagenase injections showed a mean percent improvement in penile curvature abnormality of 34% compared with 18% improvement in penile curvature in the placebo group; this change in curvature and the percent improvement in the collagenase group were significantly greater in the injection group (each p<0.001). The mean change in the PDQ symptom bother domain score was significantly improved in the collagenase group (-2.8) than in the placebo group (-1.8; p=0.004). The most frequently reported complications (24%) in the collagenase-treated group included penile ecchymosis, penile swelling, and penile pain. Six participants experienced treatment-related serious adverse events, including corporeal rupture (3 cases) and penile hematoma (3 cases). All corporeal ruptures and 1 hematoma were successfully repaired surgically. Of the other 2 penile hematomas, 1 case resolved successfully without intervention, and the other ended with aspiration.

In 2015, Lipshultz et al reported post hoc subgroup analyses from the combined data from the IMPRESS I and II studies. This analysis included a modified intention-to-treat population of 612 subjects who had both a penile curvature deformity measurement and a PDQ response at baseline and at least 1 subsequent time point after the first injection of clostridial collagenase. Subgroups included those stratified based on duration of illness, degree of plaque calcification, and International Index of Erectile Function (IIEF) severity score. Reductions in penile curvature deformity occurred in all groups, though the reductions were significantly greater with clostridial collagenase than with placebo for those with baseline penile curvature 30° to 60° and 61° to 90°, disease duration over 2 years, no calcification, and IIEF severity score of 17 or greater. PDQ symptom bother score reductions were significantly greater with clostridial collagenase than with placebo for those with penile curvature 30° to 60°, disease duration over 4 years, no calcification, and IIEF scores 1 to 5 (no sexual activity) and 17 or greater. However, generalization of this analysis is limited by its post hoc design and small subgroups.
5.01.19 Injectable Clostridial Collagenase for Fibroproliferative Disorders
Page 10 of 17

The development and validation of the PDQ has been described by Hellstrom et al (2013). Investigators developed the PDQ to assess quantitatively the symptoms and psychosexual consequences of Peyronie disease by provided 3 subscale domain scores, including psychological and physical symptoms (6 items), penile pain (3 items), and symptom bother (4 scored items and 2 yes/no questions). Questions were evaluated using baseline data for 679 (81% of the total 836 enrolled) patients in IMPRESS I and II who had been sexually active in the last 3 months. PDQ domain scores did not significantly differentiate between patients with different degrees of curvature abnormality. Coyne et al (2015) assessed the responsiveness of the PDQ to changes in Peyronie disease symptoms in men from the IMPRESS I and II trials. In this group, PDQ psychological and physical symptoms and symptom bother subscales significantly discriminated patient improvement in responses to a global assessment of the PDQ and degree of penile curvature at weeks 24 and 52.

Noncomparative Studies
Case series have reported Peyronie disease outcomes after treatment with clostridial collagenase. Many series are small (e.g., ≈20 patients) or from earlier treatment eras (e.g., 1985), which limit their utility. However, some larger studies provide data on adverse events after clostridial collagenase treatment for Peyronie disease.

Carson et al (discussed above) reported serious and nonserious adverse events after clostridial collagenase for Peyronie disease in a pooled analysis of clostridial collagenase recipients from 6 trials (total N=1044 patients). Of treated patients, 85.8% (n=896) reported at least 1 treatment-related adverse event, most frequently penile hematoma (>25% of patients). Nine (0.9%) patients had a treatment-related serious adverse event involving significant penile hematoma or corporal rupture.

A 2015 single-arm, open-label trial reported by Levine et al described outcomes for 238 subjects with Peyronie disease treated with clostridial collagenase who had both a penile curvature measurement and a PDQ response at baseline and at least 1 subsequent time point (of 347 total subjects treated). The degree of penile curvature improved from baseline to week 36 (34.4%; 95% CI, 31.2% to 37.6%) as did PDQ symptom bother score (mean change, 3.3; 95% CI, 2.8 to 3.7). However, the lack of a comparison group and exclusion of a high proportion of subjects (missing follow-up data) limit conclusions that can be drawn.

Section Summary: Peyronie Disease
The most direct evidence related to the use of clostridial collagenase injections to treat Peyronie disease comes from 2 industry-sponsored RCTs that compared clostridial collagenase with placebo. Clostridial collagenase–treated subjects demonstrated significant improvements in penile curvature (absolute percentage improvement, 16%) and reported improvements their degree of bother related to the disease. However, it is not clear that these improvements in curvature or in the degree of symptom bother translate into differences in patient outcomes or whether the benefit of treatment exceeds the risks.

Adhesive Capsulitis
No studies assessing patients with adhesive capsulitis were identified in the literature search.

Summary of Evidence
For individuals who have Dupuytren contracture who receive local clostridial collagenase injection(s), the evidence includes several placebo-controlled, randomized trials, nonrandomized comparative studies, and single-arm studies, along with systematic reviews of these studies. Relevant outcomes are symptoms, change in disease status, functional outcomes, and quality of life. The evidence from clinical trials has suggested that injectable clostridial collagenase provides short-term release of contracture. A comparison of overall outcomes compared with surgical intervention may be useful; however, randomized studies with direct comparisons are not available. Some nonrandomized studies comparing clostridial collagenase with surgery have reported similar outcomes with faster return-to-work and return-to-usual
activities rates with clostridial collagenase, but 1 study reported poorer contraction improvement though lower adverse event rates. Evidence on long-term recurrence rates is somewhat limited, but 3- and 5-year follow-up from a large registry reported high recurrence rates (47% at 5 years). Although clostridial collagenase offers the potential benefit of less-invasive treatment for Dupuytren contracture, gaps in the evidence base related to treatment durability exist. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have Peyronie disease who receive local clostridial collagenase injection(s), the evidence includes 2 randomized trials and several noncomparative studies. Relevant outcomes are symptoms, change in disease status, functional outcomes, and quality of life. The available double-blind, placebo-controlled randomized trials have demonstrated short-term improvement in penile curvature and self-reported distress from symptoms related to Peyronie disease. However, evidence demonstrating health outcome improvements is lacking. In addition, studies comparing clostridial collagenase with other therapies for Peyronie disease are lacking. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have adhesive capsulitis who receive local clostridial collagenase injection(s), the evidence is very limited. Relevant outcomes are symptoms, change in disease status, functional outcomes, and quality of life. No published literature addressing the treatment of adhesive capsulitis with clostridial collagenase was identified. The evidence is insufficient to determine the effects of the technology on health outcomes.

**Supplemental Information**

**Clinical Input from Physician Specialty Societies and Academic Medical Centers**

While the various physician specialty societies and academic medical centers may collaborate with and make recommendations during this process, through the provision of appropriate reviewers, input received does not represent an endorsement or position statement by the physician specialty societies or academic medical centers, unless otherwise noted.

**2011 Input**

In response to requests from Blue Cross Blue Shield Association, input was received from 2 physician specialty societies (2 reviews) and 5 academic medical centers (6 reviews) in 2011. Two reviewers indicated injectable clostridium collagenase is investigational for the treatment of Dupuytren contracture, noting lack of long-term data and head-to-head trials comparing collagenase with surgical options. However, despite considering this treatment investigational due to insufficient long-term evidence of effectiveness, 1 reviewer noted that injectable clostridial collagenase for Dupuytren contracture is approved by the U.S. Food and Drug Administration, and there is evidence of short- to medium-term effectiveness. Five reviewers indicated injectable clostridium collagenase for Dupuytren contracture might be considered medically necessary; they noted it is a treatment alternative to surgery. This recommendation was considered to be near-uniform support for the medical necessity of injectable clostridial collagenase for the treatment of Dupuytren contracture.

Four reviewers agreed that injectable clostridium collagenase is investigational for the treatment of Peyronie disease. One of these reviewers also commented that, while this treatment is considered investigational, it may be indicated for Peyronie disease when it is bothersome, noting that surgery is intrusive. Four reviewers also agreed injectable clostridium collagenase is investigational for the treatment of adhesive capsulitis. Finally, 6 reviewers agreed injectable clostridium collagenase is investigational for all other indications.

**2010 Input**

In response to requests from Blue Cross Blue Shield Association, input was received from 6 academic medical centers in 2010. Input was mixed, with half of those providing offering comments agreeing that use of this agent is investigational. While there was support for use in
Dupuytren contracture, comments were made about the limited amount of data on long-term outcomes and durability.

**Practice Guidelines and Position Statements**

**Dupuytren Contracture**

**National Institute for Health and Care Excellence**

In 2017, the National Institute for Health and Care Excellence recommended the use of collagenase Clostridium histolyticum to treat adults with Dupuytren contracture in cases of moderate disease where percutaneous needle fasciotomy is not an option. The Institute advised that the decision to use collagenase clostridium rather than limited fasciectomy should be made only after thorough discussion between the patient and caregiver; the Institute further defined appropriate outpatient treatment as consisting of a single injection at a time, and administered by a qualified hand surgeon.

**American Urological Association**

In 2015, the American Urological Association issued a guideline on the diagnosis and treatment of Peyronie disease. For patients with stable Peyronie disease, penile curvature greater than 30° and less than 90°, and intact erectile function (with or without the use of medications), the Association recommended intraligamental collagenase Clostridium histolyticum in combination with modeling (moderate recommendation; evidence strength grade B).

**European Association of Urology**

The 2012 European Association of Urology guidelines on penile curvature indicated injectable collagenase is a treatment option for Peyronie disease based on evidence rated as level 2b ("Evidence obtained from at least one other type of well-designed quasi-experimental study") and grade C ("Made despite the absence of directly applicable clinical studies of good quality").

**Adhesive Capsulitis**

**National Institute for Health Research**

In 2012, the National Institute for Health Research published a health technology assessment on the management of adhesive capsulitis. In this assessment, collagenase injections were not included in the treatments considered for adhesive capsulitis.

**U.S. Preventive Services Task Force Recommendations**

Not applicable.

**Medicare National Coverage**

There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

**Ongoing and Unpublished Clinical Trials**

Some currently unpublished trials that might influence this review are listed in Table 2.

**Table 2. Summary of Key Trials**

<table>
<thead>
<tr>
<th>NCT No.</th>
<th>Trial Name</th>
<th>Planned Enrollment</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT02301078</td>
<td>Comparing Short-term Function and Pain After Treatment With Collagenase Clostridium Histolyticum or Percutaneous Needle Aponeurotomy for Dupuytren’s Disease</td>
<td>60</td>
<td>Nov 2017 (ongoing)</td>
</tr>
<tr>
<td>NCT02725528</td>
<td>A Multi-Center, Randomized Controlled Trial Comparing The Clinical Effectiveness and Cost-Effectiveness of Collagenase Injection (Xiaflex) and Palmar Fasciectomy in the Management of Dupuytren’s Disease</td>
<td>128</td>
<td>Nov 2018</td>
</tr>
<tr>
<td>NCTNo.</td>
<td>Trial Name</td>
<td>Planned Enrollment</td>
<td>Completion Date</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>NCT03000114</td>
<td>Comparison of Collagenase Injection and Percutaneous Needle Aponeurotomy for Treatment of Dupuytren's Disease</td>
<td>334</td>
<td>Jan 2021</td>
</tr>
<tr>
<td>ISRCTN18254597</td>
<td>Dupuytren's interventions surgery vs collagenase</td>
<td>710</td>
<td>Oct 2021</td>
</tr>
<tr>
<td>Unpublished</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCT02193828a</td>
<td>A Phase 2a, Double-blind, Randomized, Placebo-Controlled, Dose-Ranging Study to Evaluate the Safety and Effectiveness of AA4500 in the Treatment of Dupuytren's Disease Nodules</td>
<td>76</td>
<td>Mar 2014 (completed)</td>
</tr>
<tr>
<td>NCT02006719a</td>
<td>A Randomized, Double-blind, Placebo-controlled Study of the Safety and Efficacy of AA4500 for the Treatment of Dupuytren's Disease Nodules</td>
<td>322</td>
<td>Dec 2014 (completed)</td>
</tr>
<tr>
<td>NCT01538017a</td>
<td>Comparing Injectable Collagenase (CI) and Percutaneous Needle Fasciotomy (PNF) for Dupuytren's Contracture (DC) Affecting Proximal Interphalangeal Joints (PIP). A Randomised Controlled Trial</td>
<td>50</td>
<td>Nov 2015 (completed)</td>
</tr>
<tr>
<td>NCT02267460a</td>
<td>A Phase 3b, Open-label Pilot Study to Evaluate the Safety and Effectiveness of up to Four Treatment Cycles of AA4500 in Combination With the ErecAid® Esteem® Manual Vacuum Therapy System in Men With Peyronie's Disease</td>
<td>30</td>
<td>Mar 2016 (completed)</td>
</tr>
</tbody>
</table>

ISRCTN: International Standard Randomised Controlled Trials Number; NCT: national clinical trial.
a Denotes industry-sponsored or cosponsored trial.

References


**Documentation for Clinical Review**

**Please provide the following documentation (if/when requested):**

- Procedure report(s) or progress note(s)
  - History and physical and/or consultation notes including:
    - Identification of finger joint being treated
    - Previous injection dates (if applicable)

Reproduction without authorization from Blue Shield of California is prohibited.
5.01.19 Injectable Clostridial Collagenase for Fibroproliferative Disorders

Page 16 of 17

- Treatment plan (e.g., planned injections)

Post Service
- Procedure report(s) or progress note(s)

Coding

This Policy relates only to the services or supplies described herein. Benefits may vary according to product design; therefore, contract language should be reviewed before applying the terms of the Policy. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement.

MN/IE

The following services may be considered medically necessary in certain instances and investigational in others. Services may be considered medically necessary when policy criteria are met. Services may be considered investigational when the policy criteria are not met or when the code describes application of a product in the position statement that is investigational.

<table>
<thead>
<tr>
<th>Type</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT®</td>
<td>20527</td>
<td>Injection, enzyme (e.g., collagenase), palmar fascial cord (i.e., Dupuytren's contracture)</td>
</tr>
<tr>
<td></td>
<td>20550</td>
<td>Injection(s); single tendon sheath, or ligament, aponeurosis (e.g., plantar &quot;fascia&quot;)</td>
</tr>
<tr>
<td></td>
<td>26341</td>
<td>Manipulation, palmar fascial cord (i.e., Dupuytren's cord), post enzyme injection (e.g., collagenase), single cord</td>
</tr>
<tr>
<td></td>
<td>54200</td>
<td>Injection procedure for Peyronie disease</td>
</tr>
<tr>
<td></td>
<td>54235</td>
<td>Injection of corpora cavernosa with pharmacologic agent(s) (e.g., papaverine, phentolamine)</td>
</tr>
<tr>
<td></td>
<td>96372</td>
<td>Therapeutic, prophylactic, or diagnostic injection (specify substance or drug); subcutaneous or intramuscular</td>
</tr>
<tr>
<td>HCPCS</td>
<td>J0775</td>
<td>Injection, collagenase, clostridium histolyticum, 0.01 mg</td>
</tr>
<tr>
<td>ICD-10 Procedure</td>
<td>3E0U33Z</td>
<td>Introduction of Anti-inflammatory into Joints, Percutaneous Approach</td>
</tr>
<tr>
<td>ICD-10 Diagnosis</td>
<td>All Diagnoses</td>
<td></td>
</tr>
</tbody>
</table>

Policy History

This section provides a chronological history of the activities, updates and changes that have occurred with this Medical Policy.

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Action</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/06/2012</td>
<td>New policy</td>
<td>Medical Policy Committee</td>
</tr>
<tr>
<td>07/31/2015</td>
<td>Coding update</td>
<td>Administrative Review</td>
</tr>
<tr>
<td>01/01/2016</td>
<td>Policy title change from Collagenase Clostridium Histolyticum Injections Policy revision without position change</td>
<td>Medical Policy Committee</td>
</tr>
<tr>
<td>11/01/2016</td>
<td>Policy revision without position change</td>
<td>Medical Policy Committee</td>
</tr>
<tr>
<td>12/01/2017</td>
<td>Policy revision without position change</td>
<td>Medical Policy Committee</td>
</tr>
<tr>
<td>02/01/2018</td>
<td>Policy revision without position change</td>
<td>Medical Policy Committee</td>
</tr>
</tbody>
</table>
Definitions of Decision Determinations

**Medically Necessary:** A treatment, procedure, or drug is medically necessary only when it has been established as safe and effective for the particular symptoms or diagnosis, is not investigational or experimental, is not being provided primarily for the convenience of the patient or the provider, and is provided at the most appropriate level to treat the condition.

**Investigational/Experimental:** A treatment, procedure, or drug is investigational when it has not been recognized as safe and effective for use in treating the particular condition in accordance with generally accepted professional medical standards. This includes services where approval by the federal or state governmental is required prior to use, but has not yet been granted.

**Split Evaluation:** Blue Shield of California/Blue Shield of California Life & Health Insurance Company (Blue Shield) policy review can result in a split evaluation, where a treatment, procedure, or drug will be considered to be investigational for certain indications or conditions, but will be deemed safe and effective for other indications or conditions, and therefore potentially medically necessary in those instances.

Prior Authorization Requirements (as applicable to your plan)

Within five days before the actual date of service, the provider must confirm with Blue Shield that the member's health plan coverage is still in effect. Blue Shield reserves the right to revoke an authorization prior to services being rendered based on cancellation of the member's eligibility. Final determination of benefits will be made after review of the claim for limitations or exclusions.

Questions regarding the applicability of this policy should be directed to the Prior Authorization Department. Please call (800) 541-6652 or visit the provider portal at www.blueshieldca.com/provider.

Disclaimer: This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. Blue Shield of California may consider published peer-reviewed scientific literature, national guidelines, and local standards of practice in developing its medical policy. Federal and state law, as well as contract language, including definitions and specific contract provisions/exclusions, take precedence over medical policy and must be considered first in determining covered services. Member contracts may differ in their benefits. Blue Shield reserves the right to review and update policies as appropriate.