Manipulation under Anesthesia

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DESCRIPTION

Note: *This policy does not address manipulation under anesthesia for fractures or completely dislocated joints.*

Manipulation under anesthesia (MUA) is a non-invasive procedure which combines manual manipulation of a joint or the spine with an anesthetic. Individuals who are unable to tolerate manual procedures due to pain, spasm, muscle contractures, or guarding may benefit from the use of an anesthetic agent prior to manipulation. Anesthetics may include intravenous general anesthesia or mild sedation, injection of an anesthetic to the affected area, oral medication such as muscle relaxants, inhaled anesthetics, or any other type of anesthetic medication therapy. Because the patient's protective reflex mechanism is, absent under anesthesia, manipulation using a combination of specific short lever manipulations, passive stretches, and specific articular and postural kinesthetic maneuvers to break up fibrous adhesions and scar tissue around the joint and surrounding tissue is made less difficult. Manipulation procedures can be

performed under either: general anesthesia, mild sedation, or local injection of an anesthetic agent to the affected area

MUA has been proposed as a treatment modality for acute and chronic pain conditions, when standard care, particularly of the spine, when standard care, including manipulation, and other conservative measures have failed. Manipulation under anesthesia of the spine has been used in various forms since the 1930s. Complications from general anesthesia and forceful long-lever, high-amplitude nonspecific manipulation procedures led to decreased use of the procedure in favor of other therapies. Manipulation under anesthesia was modified and revived in the 1990s. This revival has been attributed to increased interest in spinal manipulative therapy and the advent of safer, shorter-acting anesthesia agents used for conscious sedation.

Clinical Context and Therapy Purpose
The purpose of manipulation under anesthesia is to provide a treatment option that is an alternative to or an improvement on existing therapies, such as conservative management.

Populations
The relevant population of interest is individuals with for acute and chronic pain conditions.

Interventions
The therapy being considered is manipulation under anesthesia.

Manipulation under anesthesia consists of a series of mobilization, stretching, and traction procedures performed while the patient is sedated (usually with general anesthesia or moderate sedation). Manipulation under anesthesia takes 15 to 20 minutes, and after recovery from anesthesia the patient is discharged with instructions to remain active and use heat or ice for short-term analgesic control.

Comparators

Comparators of interest include conservative management.

Conservative management includes steroid regimens, blood pressure medication, muscle relaxers, and physical therapy, and is managed by physical therapists and primary care providers in an outpatient clinical setting.

Outcomes
The general outcomes of interest are symptoms, functional outcomes, quality of life, and treatment-related morbidity.

Manipulation Under Anesthesia of the Spine
Manipulation under anesthesia of the spine is described as follows: after sedation, a series of mobilization, stretching, and traction procedures to the spine and lower extremities are performed and may include passive stretching of the gluteal and hamstring muscles with straight leg raise, hip capsule stretching and mobilization, lumbosacral traction, and stretching of the lateral abdominal and paraspinal muscles. After the stretching and traction procedures, spinal manipulative therapy is delivered with high velocity, short amplitude thrust applied to a spinous process by hand, while the upper torso and lower extremities are stabilized. Spinal manipulative therapy may also be applied to the thoracolumbar or cervical area when necessary to address low back pain.

Spinal manipulation under anesthesia (SMUA) is typically performed by chiropractors, osteopathic physicians, and orthopedic physicians along with an anesthesiologist. Theoretically, SMUA is thought to stretch the joint capsules to break up adhesions within the spinal column to allow for greater mobility and reduced back pain; however, this has not been proven to be safe or effective in the peer-reviewed literature.

The Work Loss Data Institute Official Disability Guidelines (ODG) (2014) for neck, upper back; lumbar and thoracic and disorders state that, "except in urgent situations as a closed orthopedic procedure in the treatment (reduction) of vertebral fracture or dislocation. In the absence of vertebral fracture or dislocation, MUA is not supported by quality evidence in the management of spine-based neuromusculoskeletal conditions (i.e., those involving chronic pain and/or fibrotic adhesions/scar tissue). Existing studies are poor quality and vary across numerous domains including technique application, potential use of co-interventions and dosage, so any favorable outcomes reported cannot be generalized."

Methodological limitations of studies reported in a narrative review (DiGiorgio, 2013) of the literature investigating spinal manipulation under anesthesia (SMUA) concluded that, "the evidence of treatment efficacy (SMUA) remains limited, with published studies that are generally weak in their methodological quality and consistently varied across multiple domains which do not permit comparative analysis toward generalization."

Summary of Evidence
For individuals who have chronic spinal or sacroiliac pain who receive manipulation under anesthesia, the evidence includes case series and nonrandomized comparative studies. Scientific evidence on spinal manipulation under anesthesia, spinal manipulation with joint anesthesia, and spinal manipulation after epidural anesthesia and corticosteroid injection is very limited. No randomized controlled trials have been identified. At this time, there is insufficient evidence from the available peer-reviewed literature to conclude that manipulation under anesthesia of the spine in the absence of vertebral fracture, complete dislocation, or acute traumatic incomplete dislocation (subluxation) is an effective treatment for pain.

Manipulation Under Anesthesia for Treatment of Adhesive Capsulitis of the Shoulder

A frozen shoulder is a condition affecting the shoulder that causes pain and stiffness with reduced range of motion or loss of mobility. Manipulation under anesthesia is a treatment used by medical doctors/surgeons to break up adhesions and scar tissue that are causing pain and lack of movement. Manipulation under anesthesia of the shoulder is particularly effective for most individuals because the pain caused by frozen shoulder is eliminated when adhesions in the shoulder joint are broken down.

In 2020 Kim et. al. in a cohort study of 30 participants, studied early clinical outcomes of manipulation under anesthesia (MUA) compared to thirty participants with arthroscopic capsular release (ACR) among patients with refractory adhesive capsulitis (AC). The same surgeon injected a steroid mixture into the shoulder capsule along with performing internal and external rotations. The other group of participants had an arthroscopic capsular release performed with intraarticular steroid injection performed upon surgery completion. Both groups received the same postop rehabilitation protocol. Evaluation at 12 months illustrated both groups had significant improvement in ROM, but the MUA group achieved restoration of ROM earlier in the postop period. The authors concluded that MUA can be considered as a useful treatment option before pursuing ACR.

In 2017, Woods et. al. studied recurrence of frozen shoulder after MUA through prospectively collected data on 730 patients at a single institution. Further MUA was undertaken in 141 shoulders (17.8%), for which complete data was available for 126. The mean improvement in OSS for all patients undergoing MUA was 16 (26 to 42), and the mean post-operative OSS in those requiring a further MUA was 14 (28 to 42; t-test, no difference between mean improvements, $p = 0.57$). Improvement was seen after a further MUA, regardless of the outcome of the initial MUA, and of the time of recurrence.

In 2016, Bidwai et. al. conducted a prospective single surgeon patient reported outcome study to determine the results of limited anterior capsular release and controlled manipulation under anesthesia (MUA) in the treatment of primary frozen shoulder. Fifty-two patients were followed at regular intervals for a minimum of 6 months and a maximum of 12 months. Patients underwent pre and postoperative passive range of motion measurements (forward flexion, abduction, external rotation). Fifty-one patients (98%) achieved 160 degrees of forward flexion at a 6-month follow-up, with one patient only having 110 degrees. Fifty patients (96%) achieved 140 degrees of abduction at a 6-month follow-up, with one patient achieving 160 degrees and one patient limited to 90 degrees. No patients required surgical re-intervention. The authors concluded that there was a significant improvement in both pain and function modules of the Oxford Shoulder Score (OSS) and range of motion at 6 months. The median postoperative score was 41 from a maximum of 48 points, with an average mean improvement of 24 points. A combination of limited capsular release and MUA for the treatment of primary frozen shoulder is a safe and effective procedure resulting in marked improvement in pain, function, and range of motion.

In 2016 Mun et.al. reported in a prospective randomized controlled study of 121 individuals with frozen shoulder. Results from the study noted in patients (n=60) treated hydrodistension with joint manipulation under an interscalene block demonstrated better patient satisfaction and earlier restoration of range of motion than individuals (n=61) who were treated with intra-articular corticosteroid injection at 6 weeks. The pain score was lower at 12 weeks and the constant score was better in individuals with joint manipulation in the individuals treated with corticosteroid injection. Twelve months after treatment, the pain score, patient satisfaction, range of motion, and constant score were similar in the 2 groups. The authors concluded that joint manipulation provided earlier pain relief and restored shoulder range of motion and function compared with single intra-articular corticosteroid injection individuals with frozen shoulder.

Summary of Evidence
Based on review of the peer reviewed medical literature manipulation under anesthesia (MUS) for the treatment of primary frozen shoulder is a safe and effective procedure resulting in marked improvement in pain, function, and range of motion. The evidence is sufficient to determine the effects of the technology on health outcomes

Manipulation Under Anesthesia for Treatment of Stiffness After Total Knee Arthroplasty
During a total knee replacement, some tissues are exposed to the air causing essential lubricating fluids to evaporate. Affected muscles that would normally glide over each other may form adhesions that can cause pain and limit the ability to move the affected joint if the fluids are not quickly replenished after surgery. Manipulation under anesthesia is a technique used by medical doctors/surgeons of bending the knee to break up scar tissue for the treatment of stiffness and poor range of motion after total knee arthroplasty.

In 2020, Randsborg et. al. evaluated a case series of participants that experienced manipulation under anesthesia (MUA) for knee stiffness following a total knee replacement. 24 patients met the inclusion criteria; MUA was performed following a total knee arthroplasty (TKA), along with 2-3 days of continuous passive motion therapy and enhanced physiotherapy with home exercises upon discharge. The authors concluded the study supported previous findings that MUA for knee joint stiffness following a TKA improves ROM both in the short and long term.

Gu et al. (2018) conducted a systematic review of the efficacy of MUA for stiffness following total knee arthroplasty (TKA). Twenty-two studies (1488 patients) reported on ROM after MUA, and 4 studies (81 patients) reported ROM after repeat MUA. However, none of the studies appeared to include a comparison group without MUA, limiting the conclusions that can be drawn. All studies reported pre-MUA motion of less than 90°, while mean ROM at last follow-up exceeded 90° in all studies except 2. For studies reporting ROM improvement following repeat MUA, the mean pre-manipulation ROM was 80° and the mean post-manipulation ROM was 100.6°. The authors concluded that MUA remains an efficacious, minimally invasive treatment option for post-operative stiffness following TKA and provides clinically significant improvement in ROM for

most patients, with the best outcomes occurring in patients treated within 12 weeks post-operatively.

Fabricant et al. (2018) evaluated (not included in the Gu, et al. systematic review) in a case series ninety patients aged 18 years and younger who underwent lysis of adhesions (LOA) and MUA at an urban tertiary care hospital following prior knee surgery. The primary purpose of this study was to report improvements in range of motion (ROM) following LOA/MUA in children and adolescents with knee arthrofibrosis, and, secondarily, to evaluate for any effect of preoperative dynamic splinting on ROM outcomes. Demographic, clinical, ROM, and revision data were all compiled. Mean time from index surgery to LOA/MUA was 6.0±4.4 months, and follow-up was 42±56 months. The authors found 62% of the participants had full ROM at follow up, and 25% had functional ROM. It was concluded that LOA/MUA for children with arthrofibrotic knees results in significant improvements in ROM with 90% revision-free success.

A matched case control study (excluded from the Gu, et al. systematic review) was conducted by Pierce et al. (2017) to assess the incidence of revision total knee arthroplasty (TKA) among patients who underwent or did not undergo manipulation under anesthesia (MUA) after initial TKA. A prospectively collected database of two high-volume institutions was assessed for patients who required a single MUA following TKA between 2005 and 2011. The study included138 knees with a mean 8.5-year follow-up post-MUA. This was compared with a matched cohort (1:1) who underwent TKA during the same time period but did not require an MUA. Incidence of revision surgery and clinical outcomes were compared between the two cohorts. Nine knees underwent revision in the MUA cohort, and seven revisions were performed in the matched cohort. The mean Knee Society Score (KSS) and clinical scores were similar between the two cohorts. The authors concluded that undergoing an MUA was not associated with an increased risk of revision TKA.

Summary of Evidence
Based on review of the peer reviewed medical literature manipulation under anesthesia (MUA) for the treatment of stiffness after total knee arthroplasty
is a safe and effective procedure resulting in marked improvement in range of motion (ROM). The evidence is sufficient to determine the effects of the technology on net health outcomes

Manipulation Under Anesthesia for the Treatment of Tempomandibular Joint (TMJ) Pain
Tempomandibular Joint (TMJ) Pain may spontaneously resolve or reoccur or respond to warm compresses, non-steroidal anti-inflammatory drugs (NSAIDs) splint therapy or physical therapy. However, the available evidence for manipulation under anesthesia for temporomandibular joint syndrome is limited to small, uncontrolled studies with limited follow-up. The evidence is insufficient to determine the effects of the technology on net health outcomes.

Manipulation Under Anesthesia of the Toe
Ajwani et al. (2018) assessed 35 patients that had undergone first metatarsophalangeal joint (MTPJ) surgery to determine the effectiveness of MUA and steroid injection to treat joint stiffness. Documentation of ROM measurements and radiographs were reviewed. A mixture of depomedrone and bupivacaine were used for the steroid injection. Following MUA, the participants were given the Manchester–Oxford foot questionnaire (MOXFQ) to complete for assessment of their level of joint pain. The mean premanipulation total range of movement at the first MTPJ was 25° (range 5–100), immediate post-manipulation ROM was 70° (10–180), and final follow-up ROM was 50° (10–90). The average post-operative MOXFQ score was 25.2 (out of 52). The authors concluded joint ROM significantly improved after manipulation by a mean of 44.7 degrees. Limitations included small sample size, retrospective in nature and lack of randomization with no control or comparative groups.

Feuerstein et al. (2016) performed a medical records review study (n-38) to investigate the intermediate and long-term outcomes of first metatarsophalangeal (MTP) joint manipulation for arthrofibrosis that developed, specifically, as a complication of hallux valgus surgery. Medical records were reviewed at the Weil Foot and Ankle Institute, IL to identify those patients who had undergone first metatarsophalangeal (MTP) joint manipulation under anesthesia. Before the patient's visit, the medical records were reviewed to assess the course and timing of the procedures, visual analog scale (VAS) score before manipulation and range of motion (ROM) of the first MTP joint after hallux valgus correction and before manipulation and first MTP joint ROM immediately after manipulation. Manipulation procedures occurred at a mean 1.2 years from the date of the initial hallux valgus correction. The research visits occurred at a mean 6.5 years after the first MTP joint manipulation. Before manipulation, the patients had a mean VAS score of 6.5. At the research visit, the mean VAS score was 2.3. The authors concluded that joint motion was significantly improved in the direction of dorsiflexion and plantar flexion from before manipulation to both immediately after manipulation and at the final follow-up visit. They stated that the study demonstrated that joint manipulation under anesthesia could be a useful treatment modality to increase mobility and decrease pain in the patient. The limitations of the study include the lack of randomization, lack of a control or comparison group, and potential selection bias.

Summary of Evidence
The available evidence for manipulation under anesthesia for a toe is insufficient to consider the procedure proven to be effective and safe. The evidence is insufficient to determine the effects of the technology on net health outcomes.

Other Joints
Manipulation under anesthesia has also been suggested as a treatment for other joints such as the elbow, wrist, hand, finger, pelvis and ankle. A search of peer-reviewed literature finds retrospective chart reviews and single case series. There are no controlled studies or any studies reporting long-term follow-up with outcomes. Currently there is insufficient evidence in peer-reviewed medical literature to establish and support the use

of manipulation under anesthesia for other joints such as the elbow, wrist, hand, finger, pelvis and ankle.

Evidence on the efficacy of manipulation under anesthesia over several sessions or for multiple joints is also lacking.

Guidelines and Position Statements

American Academy of Orthopaedic Surgeons (AAOS)
The American Academy of Orthopaedic Surgeons (AAOS) includes manipulation under anesthesia as an option for treatment of adhesive capsulitis (frozen shoulder). *(Accessed January 2022).*

Regulatory Status
Manipulative procedures are not subject to regulation by the U.S. Food and Drug Administration.

PRIOR APPROVAL

Not applicable.

POLICY

Note: *This policy does not address manipulation under anesthesia for fractures or completely dislocated joints.*

Manipulation Under Anesthesia for Treatment of Adhesive Capsulitis of the Shoulder

Shoulder manipulation under anesthesia may be considered **medically necessary** for the treatment of adhesive capsulitis of the shoulder when **ALL** of the following criteria are met:
1. Pain and stiffness with limited range of motion which significantly interfere with activities of daily living; **and**
2. Other etiologies of shoulder pain have been excluded by clinical history, physical exam, and appropriate imaging studies to exclude significant glenohumeral osteoarthritis; **and**
3. Failure of a conservative treatment regimen, including acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), and/or oral corticosteroids for at least 3 weeks; physical therapy/home exercise program for at least 6 weeks; and an intra-articular corticosteroid injection.

Shoulder manipulation under anesthesia not meeting the above criteria and for all other indications is considered **investigational,** because the evidence is insufficient to determine the effects of the technology on net health outcomes.

Shoulder manipulation under anesthesia involving serial treatment sessions is considered **investigational,** because the evidence is insufficient to determine the effects of the technology on net health outcomes.

Manipulation Under Anesthesia for Treatment of Stiffness after Total Knee Arthroplasty (TKA)
Knee manipulation under anesthesia may be considered medically necessary for the treatment of arthrofibrosis following total knee arthroplasty (TKA) when **ALL** of the following criteria are met:
1. Pain and stiffness with limited range of motion which significantly interfere with activities of daily living; **and**
2. Other etiologies of knee pain/stiffness have been excluded by clinical history, physical exam, and appropriate imaging studies (e.g., malpositioned/incorrectly sized arthroplasty components); **and**
3. Failure of a conservative treatment regimen, including acetaminophen and/or nonsteroidal anti-inflammatory drugs (NSAIDs) for at least 3 weeks and physical therapy/home exercise program for at least 6 weeks.

Note: *The manipulation under anesthesia, if necessary, should be performed ideally within 3 months of the initial total knee arthroplasty.*

Knee manipulation under anesthesia not meeting the above criteria and for all other indications is considered **investigational,** because the evidence is insufficient to determine the effects of the technology on net health outcomes.

Knee manipulation under anesthesia involving serial treatment sessions is considered **investigational,** because the evidence is insufficient to determine the effects of the technology on net health outcomes.

Manipulation Under Anesthesia of the Spine
Spinal manipulation under anesthesia for the treatment of chronic spinal (cranial, cervical, thoracic, lumbar) pain and chronic sacroiliac joint pain is considered **investigational,** because the evidence is insufficient to determine the effects of the technology on net health outcomes.

Manipulation under anesthesia including but not limited to the following jointes for all indications whether single or serial manipulations is considered **investigational,** because the evidence is insufficient to determine the effects of the technology on net health outcomes:

- Ankle
- Elbow
- Finger
- Hand
- Hip
- Pelvis

- Temporomandibular joint (TMJ)
- Toe
- Wrist

Policy Guidelines

Definitions
Arthrofibrosis: A complication of injury or trauma where an excessive scar tissue response leads to painful restriction of joint motion, with scar tissue forming within the joint and surrounding soft tissue spaces and persisting despite rehabilitation exercises and stretches

PROCEDURE CODES AND BILLING GUIDELINES

To report provider services, use appropriate CPT* codes, Alpha Numeric (HCPCS level 2) codes, Revenue codes, and/or ICD diagnosis codes.

- 21073 Manipulation of temporomandibular joint, therapeutic, requiring anesthesia service
- 22505 Manipulation of spine requiring anesthesia, any region
- 00640 Anesthesia for manipulation of the spine or for closed procedures on the cervical, thoracic or lumbar spine
- 27860 Manipulation of ankle under general anesthesia
- 24300 Manipulation, elbow, under anesthesia
- 27275 Manipulation, hip joint, requiring general anesthesia
- 25259 Manipulation, wrist, under anesthesia
- 26340 Manipulation, finger joint, under anesthesia, each joint
- 23700 Manipulation under anesthesia, shoulder joint, including application of fixation apparatus (dislocation excluded)
- 27570 Manipulation of knee joint under general anesthesia (includes application of traction or other fixation devices)

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POLICY HISTORY

Date	Reason	Action
January 2022	Annual Review	Policy Revised
January 2021	Annual Review	Policy Revised
February 2020	Interim Review	Policy Revised
January 2020	Annual Review	Policy Revised
January 2019	Annual Review	Policy Revised
July 2018	Interim Review	Policy Revised
January 2018	Annual Review	Policy Revised
January 2017	Annual Review	Policy Renewed
January 2016	Annual Review	Policy Revised
February 2015	Annual Review	Policy Revised
March 2014	Annual Review	Policy Revised
April 2013	Annual Review	Policy Revised
April 2012	Literature Review	New Policy

New information or technology that would be relevant for Wellmark to consider when this policy is next reviewed may be submitted to:

Wellmark Blue Cross and Blue Shield
Medical Policy Analyst
PO Box 9232
Des Moines, IA 50306-9232

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