Clinical Policy Bulletin: Manipulation Under General Anesthesia

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Policy

I. Aetna considers spinal manipulation under general anesthesia (MUA) experimental and investigational. This procedure has not been established as either safe or effective for the treatment of musculoskeletal disorders such as neck and back problems. Critical issues such as selection criteria, outcome assessments, and long-term benefits need to be addressed by well-designed studies before this procedure can be considered as an essential part of conservative therapy. In this regard, the Guidelines for Chiropractic Quality Assurance and Practice Parameters published from the proceedings of a consensus conference commissioned by the Congress of Chiropractic State Associations declared that chiropractic involvement in MUA is a new area of special interest that needs further investigation.

II. Aetna considers MUA medically necessary for the following indications:
   
   A. Arthrofibrosis of knee following total knee arthroplasty, knee surgery, or fracture (see Appendix); or
   
   B. Chronic, refractory frozen shoulder (adhesive capsulitis) (see Appendix); or
   
   C. Temporomandibular joint disorders.

III. Aetna considers MUA for injuries of the cruciate ligaments, of multiple joints, for disorders of other body joints (e.g., ankle, elbow, finger, hip, pelvis, toe, and wrist), or for osteoporotic thoracolumbar vertebral compression fracture experimental and investigational because there is insufficient evidence to support this approach.

IV. Aetna considers MUA of the hand/fingers after collagenase clostridium histolyticum (Xiaflex) injections for the treatment of Dupuytren's contracture experimental and investigational.

Note: This policy is not intended to apply to examinations under anesthesia, or to setting fractures or complete joint dislocations under anesthesia.

Background

Spinal manipulation under anesthesia (SMUA) has been used mostly by osteopaths and to a much lesser degree by orthopedists to treat spinal dysfunction. This procedure was typically performed in 1 single session. More recently, some chiropractors, with the assistance of
anesthesiologists, have also employed this technique to alleviate acute and chronic neck and back pain.

The rationale for this approach is that fibrotic changes in the peri-articular and intra-articular soft tissues hinder movement, and sometimes it is necessary to anesthetize patients to reduce muscle tone and protective reflex mechanisms so that the spine can be manipulated effectively. This maneuver supposedly will break up adhesions within the surrounding spinal joints and stretch the restricting fibrotic tissue to a length compatible with motion, thereby, increasing joint function and reducing pain.

Within the realm of chiropractic, SMUA is generally performed daily for 1 to 5 consecutive days on an outpatient basis, and is followed by a post-SMUA rehabilitation regimen, which entails 1 week of daily manipulation to maintain joint mobility and avoid re-adhesion of fibrotic tissue. Anesthesia is usually induced by intravenous Pentothal (sodium thiopental), and manipulation of the affected joints takes about 7 to 10 minutes.

Although the risks associated with spinal manipulation and SMUA appear remote, serious complications following lumbar spinal manipulation, including massive cauda equina compression and vertebral pedicle fracture have been reported. For manipulation of the cervical spine, there is an increased chance of basivertebral and/or vertebral artery injury. Additionally, general anesthesia carries a small but clinically significant risk of anaphylaxis or malignant hyperpyrexia.

An assessment on SMUA (Kohlbeck and Haldeman, 2002) concluded that medicine assisted spinal manipulation therapies have a relatively long history of clinical use and have been reported in the literature for over 70 years. However, evidence for the effectiveness of these protocols remains largely anecdotal, based on case series mimicking many other surgical and conservative approaches for the treatment of chronic pain syndromes of musculoskeletal origin. There is, however, sufficient theoretical basis and positive results from case series to warrant further controlled trials on these techniques.

There is a lack of reliable evidence in the peer-reviewed published medical literature of the effectiveness of spinal manipulation under anesthesia. Evidence of spinal manipulation under anesthesia is of low quality, consisting primarily of case reports and uncontrolled case series. Limitations of current literature include small sample sizes, lack of random assignment, and limited evidence of durability. Other issues include uncertainties in patient selection criteria, and differences in protocols reported in studies, making generalizations difficult. Studies have reported on attendant risks of spinal manipulation (see., e.g., Dan & Saccasan, 1983, reporting on cases of serious complications after lumbar spinal manipulation, including massive cauda equina compression and vertebral pedicle fracture), and the risks of general anesthesia are well known. Guidelines from the American College of Occupational and Environmental Medicine (2007, 2008) and the Work Loss Data Institute (2011) state that spinal manipulation under anesthesia is not recommended.

In a prospective cohort study of 68 chronic low-back pain (LBP) patients, Kohlbeck et al (2005) measured changes in pain and disability for LBP patients receiving treatment with medication-assisted manipulation (MAM) and compared these to changes in a group only receiving spinal manipulation therapy (SMT). Outcomes were measured using the 1998 Version 2.0 American Association of Orthopaedic Surgeons/Council of Musculoskeletal Specialty Societies/Council of Spine Societies Outcomes Data Collection Instruments. The primary outcome variable was change in pain and disability. All patients received an initial 4- to 6-week trial of SMT, after which 42 patients received supplemental intervention with MAM and the remaining 26 patients continued with SMT. Low back pain and disability measures favored the MAM group over the SMT-only group at 3 months. This difference attenuated at 1 year. These investigators concluded that medication-assisted manipulation appears to offer some patients increased improvement in LBP and disability, and stated that further investigation of these apparent benefits in a randomized clinical trial is warranted.
Manipulation under anesthesia has been used for refractory cases of frozen shoulder (adhesive capsulitis) (Dias et al, 2005). Patients with frozen shoulder may describe chronic pain symptoms, but primarily complain of stiffness. The loss of range of motion causes various degrees of impaired function, including limited reaching (overhead, across the chest, etc) and limited rotation (unable to scratch the back, put on a coat, etc). On physical examination, patients with a frozen shoulder will have at least a 50 % reduction in both active and passive range of motion (ROM) compared with the unaffected shoulder (Anderson, 2008). Range of motion is estimated as follows: (i) the Apley scratch test is used to assess rotation of the shoulder joint; patients with normal glenohumeral motion should be able to scratch the midback at the T8 to T10 level; patients with frozen shoulder are not able to scratch even the lower back; (ii) the NFL touchdown sign is an active maneuver used to assess ROM of the shoulder joint and the strength of abduction; patients with a frozen shoulder are unable to fully lift their arm straight overhead; (iii) passive movement of the arm in abduction and external rotation also is measured; the normal glenohumeral joint rotates externally to 90 degrees and abducts to 90 degrees.

Manipulation under anesthesia is not first-line therapy for frozen shoulder because, in most cases, frozen shoulder is a self-limited condition that responds well to conservative therapy. In addition, MUA can actually aggravate symptoms in some people, while others may develop a recurrence of adhesive capsulitis. Less than 10 % of patients will have long-term problems that require surgery or MUA (Anderson, 2008; Ogilvie-Harris et al, 1995).

Patients with frozen shoulder should be advised to limit overhead positioning, overhead reaching, and lifting during the acute period. A non-steroidal antiinflammatory drug (NSAID) may be prescribed for pain control. Exercise is the treatment of choice during the acute period; up to one-half of patients with frozen shoulder may be expected to respond to exercise therapy (van der Windt et al, 1998). Steroid injection may hasten recovery in persons with frozen shoulder who have concurrent rotator cuff and bicipital tendinitis (van der Windt et al, 1998), and the addition of supervised physical therapy following corticosteroid injection may result in more rapid improvement than injection alone (Carette et al, 2003). Glenohumeral intraarticular injection combined with saline dilation is indicated for patients with greater than 50 % loss of ROM despite a trial of physical therapy, subacromial injection, or both (Jacobs et al, 1991).

Referral for surgery is warranted in patients who fail to have an improvement in ROM by approximately 15 % per month with the above measures (Anderson, 2008). There are 2 main surgical approaches: arthroscopic dilation of the glenohumeral joint or MUA. The former is now more commonly performed than the latter. Newer arthroscopic techniques carry out a controlled capsular release rather than a forceful manipulation with its resultant uncontrolled tearing and bleeding.

A systematic review in BMJ Clinical Evidence (Speed, 2006) found that MUA plus intra-articular injection is "likely to be beneficial" for persons with frozen shoulder. The conclusions were based upon the results of 2 randomized controlled trials (RCTs). One RCT (n = 30) found that, in people with adhesive capsulitis, MUA plus intra-articular hydrocortisone injection increased recovery rates compared with intra-articular hydrocortisone injection alone at 3 months (Thomas et al, 1980). Another, weaker RCT (n = 98) found limited evidence that more people having MUA plus intra-articular saline injection than having manipulation alone or manipulation plus intra-articular injection of methylprednisolone had improvements in ROM, pain relief, and return to normal activities (Hamdan and Al Essa, 2003). The review noted that potential adverse effects of MUA of the shoulder include intra-articular lesions within the glenohumeral joint (Speed, 2006).

In a Cochrane review, Green et al (2000) examined the effectiveness of common interventions for shoulder pain. Intervention of interest included NSAIDs, intra-articular or subacromial glucocorticosteroid injection, oral glucocorticosteroid treatment, physiotherapy, MUA,
hydrodilatation, or surgery. The authors concluded that there is little evidence to support or refute the effectiveness of common interventions for shoulder pain. They stated that there is a need for further well-designed clinical trials to establish a uniform method of defining shoulder disorders and developing outcome measures which are valid, reliable and responsive in these study populations.

Quraishi et al (2007) assessed the outcome of MUA and hydrodilatation as treatments for adhesive capsulitis. A total of 36 patients (38 shoulders) were randomized to receive either method, with all patients being treated in stage II of the disease process. The mean age of the patients was 55.2 years (44 to 70) and the mean duration of symptoms was 33.7 weeks (12 to 76). A total of 18 shoulders (17 patients) received MUA and 20 (19 patients) received hydrodilatation. There were 3 insulin-dependent diabetics in each group. The mean visual analog score (VAS) in the MUA group was 5.7 (3 to 8.5; n = 18) before treatment, 4.7 (0 to 8.5; n = 16) at 2 months (paired t-test p = 0.02), and 2.7 (0 to 9; n = 16) at 6 months (paired t-test, p = 0.0006). The mean score in the hydrodilatation group was 6.1 (4 to 10; n = 20) before treatment, 2.4 (0 to 8; n = 18) at 2 months (paired t-test, p = 0.001), and 1.7 (0 to 7; n = 18) at 6 months (paired t-test, p = 0.0006). The VAS in the hydrodilatation group were significantly better than those in the MUA group over the 6-month follow-up period (p < 0.0001). The mean Constant score in those manipulated was 36 (26 to 66) before treatment, 58.5 (24 to 90) at 2 months (paired t-test, p = 0.0004) and 65.9 (28 to 92) at 6 months (paired t-test, p = 0.0005). The Constant scores in the hydrodilatation group were significantly better than those in the MUA group over the 6-month period of follow-up (p = 0.02). The ROM improved in all patients over the 6 months, but was not significantly different between the groups. At the final follow-up, 94 % of patients (17 of 18) were satisfied or very satisfied after hydrodilatation compared with 81 % (13 of 16) of those who received MUA. Most patients were treated successfully, but those undergoing hydrodilatation did better than those who underwent MUA.

Kivimäki and colleagues (2007) examined the effect of MUA in patients with frozen shoulder. A blinded randomized trial with a 1-year follow-up was performed at 3 referral hospitals. A total of 125 patients with clinically verified frozen shoulder were randomly assigned to the manipulation group (n = 65) or control group (n = 60). Both the intervention group and the control group were instructed in specific therapeutic exercises by physiotherapists. Clinical data were gathered at baseline and at 6 weeks and 3, 6, and 12 months after randomization. The 2 groups did not differ at any time of the follow-up in terms of shoulder pain or working ability. Small differences in the ROM were detected favoring the manipulation group. Perceived shoulder pain decreased during follow-up equally in the 2 groups, and at 1 year after randomization, only slight pain remained. Manipulation under anesthesia does not add effectiveness to an exercise program performed by patients.

Flannery et al (2007) examined the influence of timing of MUA for adhesive capsulitis of the shoulder on the long-term outcome. A total of 180 consecutive patients with a diagnosis of adhesive capsulitis according to Codman's criteria were selected from a shoulder surgery database; 145 were available for follow-up after a mean period of 62 months (range of 12 to 125). All patients underwent MUA with intra-articular steroid injection. A statistically significant improvement in range of movement, function (Oxford Shoulder Score) (OSS) and VAS was obtained following manipulation. Ninety percent of the 145 patients who successfully completed the study were satisfied with the procedure; 89 % indicated that they would choose the same procedure again if the same problem arose in the opposite shoulder. Eighty-three percent of the patients had MUA performed less than 9 months from onset of symptoms (early MUA). The remainder had MUA performed after 9 to 40 months (late MUA). Patients who had early intervention had a significantly better Oxford Shoulder Score at final follow-up; mobility and pain were also better than in the late MUA group, but not significantly.

Manipulation under anesthesia has also been used to treat fibroarthrosis following total knee replacement. Following total knee arthroplasty, some patients who fail to achieve greater than
90 degrees of flexion in the early peri-operative period may be considered candidates for MUA of the knee. Manipulation under anesthesia is indicated in total knee arthroplasty having less than 90 degrees ROM 4 to 12 weeks following surgery, with no progression or regression in ROM (Pariente et al, 2006; Magit et al, 2007).

Keating et al (2007) assessed the outcomes of manipulation following total knee arthroplasty. A total of 113 knees in 90 patients underwent manipulation for post-operative flexion of greater than or equal to 90 degrees at a mean of 10 weeks after surgery. Eighty-one (90 %) of the 90 patients achieved improvement of ultimate knee flexion following manipulation. The average flexion was 102 degrees prior to total knee arthroplasty, 111 degrees following skin closure, and 70 degrees before manipulation. The average improvement in flexion from the measurement made before manipulation to that recorded at the 5-year follow-up was 35 degrees (p < 0.0001). The investigators reported that there was no significant difference in the mean improvement in flexion when patients who had manipulation within 12 weeks post-operatively were compared with those who had manipulation more than 12 weeks post-operatively. Patients who eventually underwent manipulation had significantly lower pre-operative Knee Society pain scores (more pain) than those who had not had manipulation (p = 0.0027). The investigators concluded that manipulation generally increases ultimate flexion following total knee arthroplasty. They noted that patients with severe pre-operative pain are more likely to require manipulation.

Available evidence for MUA for temporomandibular joint syndrome is limited to small, uncontrolled studies with limited follow-up. Foster et al (2000) conducted an uncontrolled prospective study of manipulation of the temporomandibular joint under anesthesia. The investigators reported that, of the 55 patients invited to participate in this study, 15 improved, 15 did not, 6 showed partial improvement, and 19 were not treated. The median pre-treatment opening was 20 mm (range of 13 to 27). Among those who improved after manipulation, the median opening after treatment was 38 mm (range of 35 to 56). The investigators reported that some of those who improved experienced a return of TMJ clicking but not of joint or muscle tenderness.

There is a paucity of evidence supporting the use of MUA for the treatment of disorders of other body joints such as the hip, ankle, knee, and wrist.

The National Academy of Manipulation Under Anesthesia Physicians’ protocols for performing serial MUA (2002) stated that if the patient regains 80 % or more of normal biomechanical function during the first procedure and retains at least 80 % of functional improvement during post MUA evaluation, then serial MUA is usually unnecessary if post MUA therapy and rehabilitation is performed.

Araghi et al (2010) have used a technique of elbow examination (manipulation) under anesthesia in select patients after surgical release to assess the smoothness of the articulation, evaluate stability, and to stretch the flexion and rotation arcs. The study comprised 51 consecutive patients who underwent an examination under anesthesia between January of 1996 and December of 2001. The examination occurred a mean of 40 days after surgery. Forty-four patients with a minimum of 12 months follow-up revealed a mean pre-examination arc of 33 degrees, which improved to 73 degrees at the final assessment. Three patients had no appreciable change (less than 10 degrees ) in the total arc, and 1 patient lost motion. Four patients underwent a second examination under anesthesia at a mean of 119 days after the first examination. The average pre-examination arc of 40 degrees increased to 78 degrees at the final assessment (mean improvement of 38 degrees). The only complication was worsening of ulnar paresthesias in 3 patients; with 2 resolving spontaneously, and 1 requiring anterior ulnar nerve transposition. The authors concluded that examination (manipulation) under anesthesia can be a valuable adjunctive procedure to help regain the motion obtained at the time of surgical release. Moreover, they stated that because this was not a controlled series, additional studies might be conducted to refine those not benefiting from this procedure.
The U.S. Food and Drug Administration's labeling of Xiaflex (collagenase Clostridium histolyticum) for Dupuytren's contracture requires a finger extension procedure for persistent palpable cord, which is described in the labeling as a passive extension of a finger for 20 seconds. Local anesthetic may be used with this procedure. The finger extension procedure may be repeated a 2nd or 3rd time at 5- to 10-min intervals. However, manipulation under general anesthesia is not necessary to accomplish this procedure.

Xiong and colleagues (1998) stated that manipulation under anesthesia (MUA) is an important method to reduce cervical spinal dislocations in the acute stage. Causes of failure have not been clearly identified and neurological complications can be the major concern. All cervical dislocations have been traditionally treated by MUA in the Christchurch Spinal Injuries Unit as the primary treatment. These researchers reviewed all 31 patients treated from 1991 to 1995, with detailed documentation of neurological progression and final outcome. Three patterns were identified: bilateral dislocation, uni-facet dislocation, and fracture dislocation. Most of the dislocations (74%) were successfully reduced by manipulation alone with minimum complications. The remaining 26% patients required open reduction. The predominant causes of failure of reduction by manipulation were co-existing fractures. The success rate of reduction by manipulation was 90% for pure bi-facet and uni-facet dislocations, but was only 22% for the fracture dislocations. The authors concluded that MUA is a safe and effective procedure for pure cervical spinal dislocations. Fractures related to the dislocation should be identified early and open reduction be considered.

Also, an UpToDate review on “Evaluation and acute management of cervical spinal column injuries in adults” (Kaji and Hockberger, 2013) does not mention the use of MUA as a management tool.

The Washington State Department of Labor and Industries' guideline on “Shoulder conditions diagnosis and treatment” (2013) recommended MUA for arthroscopic capsular release when conventional x-rays do not show bone pathology that can explain the loss of motion and patients have tried and failed 12 weeks of conservative care (including at least active assisted range of motion and home-based exercises).

Appendix

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<tr>
<th>Condition</th>
<th>Indications</th>
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<tbody>
<tr>
<td>Knee arthrofibrosis</td>
<td>MUA is considered medically necessary arthrofibrosis of knee following total knee arthroplasty, knee surgery, or fracture in persons having less than 90 degrees ROM 4 weeks to 6 months after surgery or trauma.</td>
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<tr>
<td>Frozen shoulder (adhesive capsulitis)</td>
<td>MUA is considered medically necessary for chronic, refractory frozen shoulder (adhesive capsulitis) that meets the following criteria:</td>
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<td></td>
<td>I. Adhesive capsulitis should be documented by restricted active and passive glenohumeral and scapulothoracic motion for at least 1-month duration which has either reached a plateau or worsened; and</td>
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<td>II. Significant reduction in ROM (at least a 50% reduction in both active and passive ROM compared with the unaffected shoulder); and</td>
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<td>III. Causing various degrees of impaired function, including limited reaching (e.g., overhead, across the chest) and limited rotation (e.g., unable to scratch the back, difficulty putting on a coat); and</td>
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<td>IV. Persons have undergone at least 12 weeks of conservative management, and have failed to improve, including analgesics or corticosteroids, physical therapy or therapeutic</td>
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exercises, and subacromial corticosteroid injection or hydrodilatation (arthrographic distension, hydrodilation, hydroplasty); and

V. Conventional x-rays do not show bone pathology that can explain the loss of motion.

CPT Codes / HCPCS Codes / ICD-9 Codes

**CPT codes covered if selection criteria are met:**

21073  Manipulation of temporomandibular joint(s) (TMJ), therapeutic, requiring an anesthesia service (ie, general or monitored anesthesia care)

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)

**CPT codes not covered for indications listed in the CPB:**

00640  Anesthesia for manipulation of the spine or for closed procedures on the cervical, thoracic, or lumbar spine

22505  Manipulation of spine requiring anesthesia, any region

24300  Manipulation, elbow, under anesthesia

25259  Manipulation, wrist, under anesthesia

26340  Manipulation, finger joint, under anesthesia, each joint

27194  Closed treatment of pelvic ring fracture, dislocation, diastasis or subluxation; with manipulation, requiring more than local anesthesia

27275  Manipulation, hip joint, requiring general anesthesia

27860  Manipulation of ankle under general anesthesia (includes application of traction or other fixation apparatus)

**Other HCPCS codes related to the CPB:**

J0775  Injection, collagenase, clostridium histolyticum, 0.01 mg

**ICD-9 codes covered if selection criteria are met:**

524.60 - 524.69  Temporomandibular joint disorders

718.56  Ankylosis of joint, lower leg [arthrofibrosis following knee surgery or fracture]

726.0  Adhesive capsulitis of shoulder

802.20 - 802.5  Fracture of mandible, closed or open, or malar and maxillary bones closed or open
821.20 - 823.12  Fracture of lower end of femur, open or closed, fracture of patella, and fracture of upper end of tibia and fibula, open or closed

823.32  Fracture of tibia and fibula, shaft, open

830.0 - 830.1  Dislocation of jaw, closed or open

836.0 - 836.69  Dislocation of knee

V43.65  Joint replaced by other means, knee [arthrofibrosis following total knee arthroplasty]

ICD-9 codes not covered for indications listed in the CPB (not all-inclusive):

710.0 - 725, 726.10 - 739.9  Diseases of the musculoskeletal system and connective tissue [other than adhesive capsulitis of shoulder] [injuries of the cruciated ligament] [Dupuytren's contracture]

844.2  Sprain of cruciate ligament of knee

959.7  Injury knee, leg, ankle, and foot [cruciate ligament]

The above policy is based on the following references: