



# CIGNA MEDICAL COVERAGE POLICY

The following Coverage Policy applies to all plans administered by CIGNA Companies including plans administered by Great-West Healthcare, which is now a part of CIGNA.

**Subject Continuous Passive Motion (CPM) Devices**

**Effective Date ..... 8/15/2011**  
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**Coverage Policy Number ..... 0198**

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## Hyperlink to Related Coverage Policies

Manipulation Under Anesthesia (MUA)  
Stretch Devices for Joint Stiffness and Contractures  
Temporomandibular Joint (TMJ) Disorder Surgery

### INSTRUCTIONS FOR USE

Coverage Policies are intended to provide guidance in interpreting certain **standard** CIGNA HealthCare benefit plans. Please note, the terms of a customer's particular benefit plan document [Group Service Agreement (GSA), Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a customer's benefit plan document **always supercedes** the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. In certain markets, delegated vendor guidelines may be used to support medical necessity and other coverage determinations. Proprietary information of CIGNA. Copyright ©2011 CIGNA

## Coverage Policy

Coverage for continuous passive motion (CPM) devices is subject to the terms, conditions and limitations of the applicable plan's Durable Medical Equipment (DME) benefit and schedule of copayments. Please refer to the applicable benefit plan document to determine benefit availability and the terms, conditions and limitations of coverage. Under many benefit plans, coverage for DME is limited to the lowest-cost alternative.

If coverage for CPM devices is available, the following conditions of coverage apply.

CIGNA covers a CPM device as medically necessary for up to 21 days in an individual in the early phase of rehabilitation (e.g., physical therapy, home exercise program) when ANY of the following criteria is met:

- following total knee replacement, including revision, or revision of a worn component
- following treatment of knee arthrofibrosis by manipulation under anesthesia and/or surgical release
- following anterior or posterior cruciate ligament (ACL, PCL) repair/reconstruction
- following an injury-or surgical repair of the articular cartilage of the knee -

CIGNA does not cover a CPM device for rehabilitation or treatment of ANY other joint, including but not limited to the shoulder, elbow, wrist, hand, or hip, or for any indication not listed above, including but not limited to the following, because it is considered experimental, investigational, or unproven:

- Dupuytren's contracture
- low back pain
- rheumatoid arthritis in the absence of a listed covered condition
- rotator cuff repair
- temporomandibular joint (TMJ) repair

**CIGNA does not cover a CPM device beyond 21 days because it is considered not medically necessary.**

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## General Background

Continuous passive motion (CPM) is a rehabilitation technique designed to assist in recovery of joint range of motion (ROM). CPM provides progressive passive ROM to an extremity through an externally applied force. The device contains two parts; a carriage for support of the extremity and a controller that can be programmed for ROM, speed, pause, and duration of treatment. During CPM therapy, the joint area is secured in the device, and it is programmed to flex and extend the joint passively. CPM use is based on the theory that recovery will be accelerated by decreasing soft tissue stiffness, increasing ROM, and promoting healing of joint surfaces in soft tissues, and preventing the development of adhesions. Motion and stress are important for the maintenance of normal connective tissue and the healing of injured connective tissue. Motion enhances blood flow and decreases pain. Passive motion involves movement of a joint without active contraction of muscle groups. It is used to maintain ROM and flexibility in joints in the early postoperative and rehabilitative period after surgery or injury when active movement might disrupt the repair process or is too painful to perform (ECRI, 2009; DeLee and Drez's Orthopaedic Sports Medicine, 2003).

CPM has been used in the rehabilitation period following surgery or injury to synovial joints or associated tissues. It is generally used as an adjunct to active physical therapy. Most of the published literature has evaluated CPM following total knee arthroplasty (TKA) and anterior cruciate ligament (ACL) reconstruction or repair. CPM is also frequently used following posterior cruciate ligament (PCL) repair; following manipulation under anesthesia or surgical release of knee arthrofibrosis that may occur following surgical procedures performed on the knee; and following an injury or surgical repair of the knee articular cartilage. CPM has been proposed for treatment of various other joints, including the shoulder, elbow, wrist, hand, ankle and hip, and temporomandibular joint. There is insufficient evidence to support the use of CPM in the rehabilitation of joints other than the knee, however

### U.S. Food and Drug Administration (FDA)

CPM machines are considered Class II devices and are generally approved through the 510(k) process. CPM devices are most commonly used for the knee, but are available for many joints, including the elbow, hip, ankle, shoulder, and fingers.

### Literature Review

**Total Knee Arthroplasty (TKA):** A Cochrane review evaluated CPM following total knee arthroplasty in people with arthritis (Harvey et al., 1009). Twenty randomized controlled trials met the inclusion criteria. The authors stated that there is high quality evidence that CPM increases passive knee flexion range of motion (mean difference, two degrees) and active knee flexion range of motion (mean difference three degrees), and noted that these differences are too small to be clinically worthwhile. The authors also noted that there is low quality evidence that CPM has no effect on length of hospital stay, but reduces the need for manipulation under anesthesia.

Lenssen et al. (2008) conducted a randomized controlled trial to evaluate the effectiveness of prolonged CPM use in the home following TKA (n=60). Patients were randomly assigned to the experimental group (n=30) treated with CPM and physical therapy (PT) for 17 consecutive days or to the usual care group (n=30) treated with approximately four days of CPM and PT followed by PT alone for two weeks after discharge. From 18 days to three months after surgery, both groups received PT alone. Outcome measures included ROM and functional recovery (e.g., ambulation) and were assessed at time of discharge, six weeks, and three months after surgery. The only statistically significant difference between the two groups which favored the experimental group was in ROM at time of discharge ( $p = 0.04$ ). No significant difference in ROM was noted at any other assessment

period. This study suggests that prolonged use of CPM may have short-term effects on ROM but this did not translate into improved function nor did the improvement continue into the long-term.

Postel et al. (2007) performed a systematic review of the literature regarding the use of CPM after TKA in order to develop clinical practice guidelines. After analysis of 21 studies included in the review, the authors determined that CPM after TKA could have short-term beneficial influence on the speed of recovery of motion, early flexion, postoperative pain, knee swelling and length of hospital stay but found no long-term confirmation of the early benefit of CPM. The authors concluded that, although there is insufficient evidence to recommend substituting CPM for other modalities of rehabilitation following TKA, it can be used as an adjunctive option to accelerate short-term results.

Brosseau et al. (2004) conducted a meta-analysis of randomized clinical trials, controlled clinical trials, case control and cohort studies published through 2003 to determine the effectiveness of CPM following knee arthroplasty. CPM in combination with standard PT was compared to standard PT alone. The outcome measures were active and passive knee ROM, length of hospital stay, pain, swelling, fixed flexion deformity and quadriceps strength at end of treatment and during follow-up. Fourteen studies 952 patients met the inclusion criteria. The results suggested that CPM combined with PT is effective at increasing active knee flexion compared to PT interventions alone. Patients who received CPM in addition to PT were discharged from the hospital earlier and required fewer postoperative knee manipulations than those who received PT alone.

In a Cochrane review, Milne et al. (2003, updated 2008) evaluated 14 trials to determine the effectiveness of CPM following TKA. In the main comparison of CPM combined with physiotherapy (PT) versus PT alone, the results favored CPM. CPM combined with PT was found to increase active knee flexion and decrease length of stay to a statistically significant degree. The authors concluded that CPM combined with PT may offer beneficial results compared to PT alone in the short-term rehabilitation following TKA.

**Anterior Cruciate Ligament (ACL) Reconstruction:** Engstrom et al. (1995) reported on a prospective randomized study of 34 patients with unilateral anterior cruciate ligament ruptures randomized to either the early active motion group (n=17) or the active motion with CPM group (n=17). Outcome measurements included ROM and joint swelling, evaluated preoperatively and at six weeks post-operation. At six weeks follow-up, there was no difference in ROM between the two groups, and joint swelling was more pronounced in the early active motion group. The data suggests that CPM did not improve ROM.

McCarthy et al. (1993) evaluated the effect on pain when CPM is used immediately following ACL reconstruction. Thirty patients were randomized to a rehabilitation program with CPM (n=15) or without CPM (n=15). The CPM group used significantly less ( $p<.05$ ) narcotics within the first postoperative 24 hours and used patient-controlled analgesia (PCA) less frequently ( $p<.05$ ) compared to the no-CPM group. The CPM group also received significantly less ( $p<.05$ ) oral medication on postoperative days two and three. There was no significant difference between the two groups regarding perceived pain. The study did not address whether these results affected functional outcome.

Rosen et al. (1992) conducted a prospective study to examine the effects of CPM and supervised active ROM following ACL repair (n=75). Patients with ACL deficiencies treated with arthroscopic ACL autograft reconstruction were randomized into one of three groups. Group A (n=25), the active motion group, received PT three times a week. Group B (n=25) received PT and CPM. Group C (n=25) received CPM but no formal PT. Evaluations occurred at specific intervals for six months. The authors reported no statistically significant differences among the three groups in drain output, medication usage, hospital length of stay, or in any other outcome measures. The authors concluded that effects of CPM on ROM were similar to that of active motion and that neither protocol had deleterious effects on stability.

**Other Indications:** Thien et al. (2004, updated 2008) conducted a Cochrane systematic review to determine the optimal rehabilitation strategy after surgery for flexor tendon injuries in the hand, based on evidence from randomized controlled trials. One trial compared CPM with controlled intermittent passive motion and found a significant difference in mean active motion in favor of CPM. Other trials compared various rehabilitation regimens, including active flexion with rubber band traction vs. early controlled active mobilization, early controlled active mobilization with early controlled passive mobilization and dynamic splinting vs. static splinting. The authors concluded that controlled mobilization regimens are widely employed in rehabilitation after flexor

tendon repair in the hand, and that there is insufficient evidence from randomized controlled trials to define the best mobilization strategy.

Handoll et al. (2003) conducted a Cochrane systematic review to assess the effectiveness of rehabilitation interventions with conservatively or surgically treated distal radial fractures. The 12 studies reviewed involved a total of 601 older female patients with fractures of the distal radius treated with rehabilitation interventions, such as active and passive mobilization exercises. There were no difference in outcomes between supervised and unsupervised exercises and no clinical significance between passive mobilization and whirlpool and no exercise. An update to this review (2006) determined that there continues to be insufficient evidence to determine which form of rehabilitation results in the best outcomes for patients with wrist fractures.

Alfredson et al. (1999) conducted a retrospective study of 57 consecutive patients with an isolated full-thickness cartilage defect of the patella and disabling knee pain of long duration. Patients were treated by autologous periosteal transplantation to the cartilage defect. The first 38 consecutive patients (group A) were postoperatively treated with CPM, and the next 19 consecutive patients (group B) were treated with active motion for the first five days postoperatively. In both groups, the initial regimens were followed by active motion, slowly progressive strength training, and slowly progressive weight bearing. In group A, after a mean follow-up of 51 months, 29 patients (76%) were graded as excellent or good, seven patients (19%) were graded as fair, and two patients (5%) were graded as poor. In group B, after a mean follow-up of 21 months, 10 patients (53%) were graded as excellent or good, six patients (32%) were graded as fair, and three patients (15%) were graded as poor. Nine of the fair or poor cases (50%) were diagnosed with chondromalacia of the patella. The authors concluded that the results are good when CPM is used following autologous periosteal transplantation in patients with full-thickness cartilage defects of the patella and disabling knee pain. The clinical results using active motion postoperatively were not acceptable, especially in patients with chondromalacia of the patella.

Lastayo et al. (1998) conducted a randomized outcome study of 31 patients (32 rotator cuffs) who had rotator cuff repair. The patients were randomly assigned to CPM (n=17) or manual passive range-of-motion exercises (n=15). The Shoulder Pain and Disability Index was used to subjectively evaluate the treatment results, and there was no significant difference between the two groups (p=0.853). Using the Visual Analog Scale, the level of pain decreased in both groups, but there was no significant difference in the mean scores in each group (p=0.92). No significant difference in ROM (p>0.20) or strength (p>or = to 0.20) was reported. The data suggests that although both CPM and manual passive range-of-motion provided improvement in ROM, strength, function and pain relief, there was no significant difference between the two groups.

Ring et al. (1998) conducted a randomized, controlled trial (n=22) of CPM after metacarpophalangeal joint arthroscopy for rheumatoid arthritis. Patients were assigned to two groups for treatments following surgery. The treatments, including static and dynamic splints, were compared to CPM intermittent active flexion and extension. No benefit was seen with CPM, and some patients reported fatigue due to the weight of the CPM device compared to controls.

Garofalo et al. (2010) conducted a randomized controlled trial to evaluate the use of CPM following arthroscopic rotator cuff repair (n=100). Patients were randomized to a postoperative physical therapy regimen consisting of passive self-assisted range of motion exercise supervised by a physiotherapist (n=46, group A) or passive self-assisted ROM exercise associated with use of CPM for a total of two hours per day (n=54, group B) for four weeks. CPM was used in four 30-minute sessions. During weeks five through twelve, the same therapy (i.e., passive mobilization with the physiotherapist) was administered to both groups, and for weeks 13 through 28, active-assisted ROM exercises were added, along with progressive isometric reinforcement exercise. An independent examiner assessed patients at 2, 5, 6, and 12 months based on VAS, range of motion for abduction (ABD), forward flexion (FF) and external rotation in abduction (ER2). At 2.5 months, patients in group B had significantly better values for VAS ( $7.5 \pm 0.1$ ) ( $P < 0.01$ ), FF ( $133 \pm 21.1$ ) ( $P < 0.01$ ), ABD ( $66.7 \pm 14.5$ ) ( $P < 0.05$ ) and ER2 ( $63.5 \pm 15.4$ ) ( $P < 0.05$ ) than group A: VAS ( $9.1 \pm 0.2$ ), FF ( $120.7 \pm 20.6$ ), ABD ( $60.1 \pm 14$ ) and ER2 ( $56 \pm 14$ ). At six months, however, there was no longer any significant difference in the VAS values, and at one year there were no statistically significant differences between the values for any of the parameters.

Raab et al. (1996) conducted a prospective, randomized controlled study on 26 patients who underwent rotator cuff repair and completed three-month follow-up. Patients were randomized to the control group (n=12) who received PT only or the study group (n=14) who received PT plus CPM. Outcomes were evaluated using a shoulder score questionnaire which consisted of four areas: function, pain, muscle strength and ROM. No

significant difference in shoulder scores were reported at three month follow-up, although significant improvements in the study group were noted in specific subgroups, including: pain relief in female patients (p=0.00185), pain relief in patients age 60 or older (0.0364), and increased ROM (0.0138) in the study group.

Continuous passive motion may also play a role following manipulation under anesthesia or surgical release of knee arthrofibrosis (DeLee and Drez's Orthopaedic Sports Medicine, 2009). Arthrofibrosis may occur following surgical procedures, including ACL reconstruction or total knee arthroplasty, and is associated with inflammation and scar tissue proliferation. Arthrofibrosis may also occur following traumatic injury of the knee. CPM is described as a component of the rehabilitation protocol in a study of arthroscopic treatment of arthrofibrosis following TKA. CPM was applied three times per day in the immediate postoperative period, and continued for at least 14 days (Jerosch and Aldawoudy, 2006).

### Summary

The published studies provide evidence that continuous passive motion (CPM) can improve health outcomes in the early postoperative phase (21 days post-operation) in patients who have undergone total knee arthroplasty (TKA) or anterior cruciate ligament (ACL) repair/reconstruction. There is adequate evidence that CPM used as an adjunct to active physical therapy may decrease knee swelling, improve flexion and decrease the need for knee manipulation following these procedures. CPM may also be used following posterior cruciate ligament (PCL) repair, following injury or surgical repair of the articular cartilage of the knee, or to treat knee arthrofibrosis that may occur following surgical procedures performed on the knee. CPM has also been proposed for rehabilitation of other joints such as the shoulder, elbow, wrist, hand, ankle, knee, or hip, and for treatment of numerous conditions, including degenerative joint conditions and diseases (e.g., rheumatoid arthritis, Dupuytren's contracture). There is insufficient evidence in the medical literature evaluating the use of CPM for these conditions or for rehabilitation of joints other than the knee. Evidence published to date has failed to demonstrate that the use of CPM results in improved outcomes (i.e., decreased pain or improved range of motion) when applied to other joints/conditions, compared to an active physical therapy program.

### Coding/Billing Information

**Note:** This list of codes may not be all-inclusive.

#### Continuous passive motion (CPM) for knee:

**Covered when medically necessary:**

HCPSC Codes	Description
E0935	Continuous passive motion exercise device for use on knee only

ICD-9-CM Diagnosis Codes	Description
715.16	Osteoarthritis, localized, primary, lower leg
715.26	Osteoarthritis, localized, secondary, lower leg
715.36	Osteoarthritis, localized, not specified whether primary or secondary, lower leg
715.96	Osteoarthritis, unspecified whether generalized or localized, lower leg
717.7	Chondromalacia of patella
717.83	Old disruption of anterior cruciate ligament
717.84	Old disruption of posterior cruciate ligament
717.9	Unspecified internal derangement of knee
718.56	Ankylosis of lower leg joint
719.46	Pain in joint; lower leg
719.56	Stiffness of joint, not elsewhere classified, lower leg
719.96	Unspecified disorder of joint, lower leg
836.3	Dislocation of patella, closed
836.4	Dislocation of patella, closed

844.2	Sprains and strains of knee and leg; cruciate ligament of knee
V43.65	Organ or issue replaced by other means, joint, knee

**Experimental/Investigational/Unproven/Not Covered:**

ICD-9-CM Diagnosis Codes	Description
714.0	Rheumatoid arthritis
836.0	Tear of medial cartilage or meniscus of knee, current
836.2	Other tear of cartilage or meniscus of knee, current
	All other codes

**Continuous passive motion (CPM) for joint other than knee:**

**Experimental/Investigational/Unproven/Not Covered:**

E0936	Continuous passive motion exercise device for use on other than knee
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ICD-9-CM Diagnosis Codes	Description
524.60-524.69	Temporomandibular joint disorders
714.0	Rheumatoid arthritis
715.00	Osteoarthritis, generalized, site unspecified
715.90	Osteoarthritis, unspecified whether generalized or localized; site unspecified
718.01	Articular cartilage disorder, shoulder region
718.02	Articular cartilage disorder, upper arm
718.03	Articular cartilage disorder, forearm
718.04	Articular cartilage disorder, hand
718.05	Articular cartilage disorder, pelvic region and thigh
718.07	Articular cartilage disorder, ankle and foot
718.41	Contracture of joint; shoulder region
718.51	Ankylosis of joint; shoulder region
719.45	Pain in joint; pelvic region and thigh
722.52	Degeneration of thoracic or lumbar intervertebral disc, lumbar or lumbosacral intervertebral disc
724.2	Lumbago
724.5	Backache, unspecified
726.0	Adhesive capsulitis of shoulder
726.10	Disorders of bursae and tendons in shoulder region, unspecified
726.2	Other affections of shoulder region, not elsewhere classified
727.61	Complete rupture of rotator cuff
728.6	Contracture of palmar fascia
733.92	Chondromalacia
830.0	Dislocation of jaw
840.4	Sprains and strains of shoulder and upper arm; Rotator cuff (capsule)
840.7	Superior glenoid labrum lesion
843.8	Sprains and strains of other specified sites of hip and thigh
V43.64	Organ or tissue replaced by other means, hip joint
	All other codes

**\*Current Procedural Terminology (CPT®) ©2010 American Medical Association: Chicago, IL.**

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## Policy History

<b>Pre-Merger Organizations</b>	<b>Last Review Date</b>	<b>Policy Number</b>	<b>Title</b>
CIGNA HealthCare	8/15/2008	0198	Continuous Passive Motion (CPM) Devices
Great-West Healthcare	10/26/2006	04.263.02	Continuous Passive Motion (CPM)

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