Anterior Cervical Spine Decompression and Fusion in Adults

Number 7.01.560
Effective Date May 1, 2016
Revision Date(s) 05/24/16; 04/12/16; 11/10/15; 09/08/15; 05/12/15; 02/10/15
Replaces 11.01.505 (renumbered)

**Note:** A cervical spine *decompression* as a stand-alone procedure is not subject to medical review. Requests for multi-level cervical fusions of 2 or more fusion levels must be reviewed by a medical director.

Anterior cervical fusion may be considered **medically necessary** for **any** of the following conditions when criteria are met:

- **Cervical radiculopathy** and **ALL** of the following:
  - Patient has unremitting radicular pain or progressive weakness secondary to nerve root compression.
  - Non-operative therapy for at least 6 weeks has failed, including Physical Therapy AND **1 or more** of the following:
    - Medical treatment with NSAIDs, or other analgesics (non-narcotic or narcotic)
    - Cervical collar
    - Exercise program
    - Oral corticosteroids
    - Acupuncture
  - A cervical spine MRI or CT scan with myelogram within the past 12 months which demonstrates spinal stenosis or nerve root compression that corresponds to symptoms and physical exam findings

- **Spondylotic myelopathy** treatment indicated by **ALL** of the following:
  - Signs or symptoms of myelopathy are present as indicated by **1 or more** of the following:
    - Upper limb weakness in more than single nerve root distribution
    - Lower limb weakness
    - Loss of dexterity (e.g., clumsiness of hands)
    - Bowel or bladder incontinence
    - Frequent falls
    - Hyperreflexia
    - Hoffmann sign
    - Increased extremity muscle tone or spasticity
    - Gait abnormality
    - Babinski sign
  - A cervical spine MRI or CT scan with myelogram within the past 12 months which demonstrates spinal stenosis or nerve root compression corresponding to symptoms and physical exam findings due to **1 or more** of the following:
    - Herniated disk
    - Osteophyte
• **Cervical pseudoarthrosis** and **ALL** of the following:
  o Neck pain unresponsive to non-operative therapy of at least 6 weeks, including Physical Therapy and **1 or more** of the following:
    ▪ Medical treatment with NSAIDs or other analgesics (non-narcotic or narcotic)
    ▪ Cervical collar
    ▪ Exercise program
    ▪ Oral corticosteroids
    ▪ Acupuncture
  o Alternative etiologies of symptoms ruled out
• **Degenerative spinal segment** adjacent to prior decompressive or fusion procedure with **1 or more** of the following:
  o Symptomatic myelopathy corresponding clinically to adjacent level
  o Symptomatic radiculopathy corresponding clinically to adjacent level and unresponsive to non-operative therapy of at least 6 weeks, including Physical Therapy AND **1 or more** of the following:
    ▪ Medical treatment with NSAIDs or other analgesics (non-narcotic or narcotic)
    ▪ Cervical collar
    ▪ Exercise program
    ▪ Oral corticosteroids
    ▪ Acupuncture
• **Cervical spine injury** (e.g. trauma), as indicated by **ALL** of the following:
  o Acutely symptomatic cervical radiculopathy or myelopathy
  o MRI or other neuroimaging finding (e.g., cord compression, root compression) demonstrates pathologic anatomy corresponding to symptoms.

Anterior cervical fusion may be considered **medically necessary** in the following situations:
• **Degenerative cervical spondylosis** with kyphosis causing cord compression
• **Infection of cervical spine** requiring decompression or debridement
• **Ossification of posterior longitudinal ligament (OPLL)** at 1 to 3 levels associated with myelopathy
• **Posttraumatic cervical instability** (e.g. unstable anterior column fracture)
• **Tumor of cervical spine** causing pathologic fracture, cord compression, or instability

**Documentation**
The following information must be **submitted** to ensure an accurate, expeditious, and complete review for cervical spinal fusion surgery:
• Specific procedures requested with related procedure/diagnosis codes and identification of disc level(s) for surgery
• Office notes that include a current history and physical exam
• Clinical notes that document the requesting surgeon personally evaluated the individual at least twice before submitting a request for surgery (except in cases of malignancy, trauma, infection or rapidly progressive neurologic symptoms)
• Detailed documentation of extent and response to conservative therapy, if applicable, including outcomes of any procedural interventions, medication use and physical therapy/physiatrist notes
• Copy of radiologist’s report(s) for diagnostic imaging (MRIs, CTs, etc.) completed within the past 12 months. Imaging must be performed and read by an independent radiologist. If discrepancies should arise in the interpretation of the imaging, the radiologist report will supersede

**Related Policies**

7.01.551 Lumbar Spine Decompression Surgery: Discectomy, Foraminotomy, Laminotomy, Laminectomy
Policy Guidelines

Note: This policy only applies to the adult population age 19 and older.

Definition of Terms

Babinski sign: Extension of the big toe when the foot is stroked.

Cervical myelopathy: Loss of function in the upper and lower extremities due to compression of the spinal cord within the neck.

Cervical radiculopathy: Persistent neck pain that radiates into the shoulder/arm in a dermatomal/single nerve pattern, or progressive weakness caused by irritation or injury near the root of a spinal nerve in the neck. The North American Spine Society (NASS) describes the most common clinical findings as arm pain, neck pain, scapular or periscapular pain, and paresthesias, numbness and sensory changes, weakness, or abnormal deep tendon reflexes in the arm.

Cervical spondylosis: Abnormal wear of the cartilage and bones in the cervical vertebrae. This includes the discs or cushions between the neck vertebrae and the joints between the bones of the cervical spine. May result in bone spurs.

Dermatome/dermatomal: Each area of skin (dermis) has sensory nerve fibers coming from a single spinal nerve root (see Appendix).

Hoffman’s sign/Finger Flexor reflex – Holding the patient’s middle finger loosely and flicking the fingernail downward, causing the finger to rebound slightly into extension. If the thumb flexes and adducts in response, Hoffmann’s sign is present.

Myotome: Muscle of the back supplied by a nerve of the spine

Pseudoarthrosis – When bones fail to fuse with one another after spinal fusion surgery. Lack of union at the fused location.

Sclerotome: Cartilage, tendons and endothelial cells that form the back bones and rib cartilage

Coding

<table>
<thead>
<tr>
<th>CPT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>22551</td>
<td>Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophytectomy and decompression of spinal cord and/or nerve roots; cervical below C2</td>
</tr>
<tr>
<td>22552</td>
<td>Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophytectomy and decompression of spinal cord and/or nerve roots; cervical below C2, each additional interspace (List separately in addition to code for separate procedure)</td>
</tr>
<tr>
<td>22554</td>
<td>Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); cervical below C2</td>
</tr>
<tr>
<td>22585</td>
<td>Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); each additional interspace (List separately in addition to code for primary procedure)</td>
</tr>
</tbody>
</table>

Description

Cervical fusion is a surgery that joins or fuses selected bones in the neck. It is performed through an incision on the front (anterior) or back (posterior) of the neck. Cervical fusion is often performed when the cervical vertebrae
become damaged due to injury or chronic degenerative changes, leading to compression of the spinal cord or the cervical nerve root. The expected outcome from cervical fusion is stabilization of the vertebrae and alleviation of pain and/or weakness resulting from vertebral instability.

Bone grafts are often used, taken from elsewhere in the body or received from a bone bank. Metal implants can be used to hold the vertebrae together until new bone grows between them. Metal plates can be screwed into the bone, joining adjacent vertebrae. An entire vertebra can be removed, and the spine then fused. A spinal disc can be removed and the adjacent vertebrae fused.

Clinical complications of cervical fusion surgery include infection, injury to the nerves, misplaced, broken, or loosened plates, screws or implants, injury to the spinal cord, possible need for additional surgery in the future due to adjacent segment breakdown and increased pain.

An adequate course of conservative treatment may avert the need for surgical intervention.

Scope

Medical policies are systematically developed guidelines that serve as a resource for Company staff when determining coverage for specific medical procedures, drugs or devices. Coverage for medical services is subject to the limits and conditions of the member benefit plan. Members and their providers should consult the member benefit booklet or contact a customer service representative to determine whether there are any benefit limitations applicable to this service or supply. This medical policy does not apply to Medicare Advantage.

Benefit Application

Prior authorization review and approval is required on all indications with submission of clinical information that supports the medical necessity for cervical fusion surgery. Please call the Customer Service number on the member's ID card for information about a prior authorization.

Rationale

This policy was created in July 2014 using the MEDLINE database and guidelines from professional organizations and updated through July 2015. Research was conducted to determine the indications for cervical fusion, and compare the clinical benefits and potential harms of cervical fusion to conservative management.

American Association of Neurologic Surgeons (AANS) Guideline - 2009

The AANS published guidelines in 2009 that used a systematic review of the National Library of Medicine and Cochrane database, regarding indications for anterior cervical decompression for the treatment of cervical degenerative radiculopathy. They state: "In the acute phase, non-operative management is the mainstay, with success rates averaging 90%." The AANS further states: "When clinical cervical radiculopathy is present with active nerve root compression visible on diagnostic imaging, the clinician often recommends surgical decompression if nonoperative measures have failed." While they state that anterior nerve root decompression via anterior nerve root discectomy with or without fusion for radiculopathy is associated with rapid relief (3-4 months) compared with physical therapy, they acknowledge that at the 12-month point, comparable clinical improvements with PT or cervical immobilization are also present. They also acknowledge that there is insufficient data to factor in the cost of complications and any undesirable long-term effect related to the specific surgical intervention, such as adjacent segment disease.
North American Spine Society (NASS) Guideline - 2010
The NASS issued a guideline in 2010 on the diagnosis and treatment of cervical radiculopathy from degenerative disorders. MRI or CT scans are suggested only after a patient has failed a course of conservative therapy and is being considered for interventional or surgical treatment.

Diagnosis:
- It is suggested that the diagnosis of cervical radiculopathy be considered in patients with arm pain, neck pain, scapular or periscapular pain, and paresthesias, numbness and sensory changes, weakness, or abnormal deep tendon reflexes in the arm. These are the most common clinical findings seen in patients with cervical radiculopathy (Grade B – Fair evidence)
- It is suggested that the diagnosis of cervical radiculopathy be considered in patients with atypical findings such as deltoid weakness, scapular winging, weakness of the intrinsic muscles of the hand, chest or deep breast pain, and headaches. Atypical symptoms and signs are often present in patients with cervical radiculopathy and can improve with treatment (Grade B – Fair evidence)
- Magnetic resonance imaging is suggested for the confirmation of correlative compressive lesions (disc herniation and spondylosis) in cervical spine patients who have failed a course of conservative therapy and who may be candidates for interventional or surgical treatment (Grade B – Fair evidence)
- In the absence of reliable evidence, it is the work group’s opinion that CT may be considered as the initial study to confirm a correlative compressive lesion (disc herniation or spondylosis) in cervical spine patients who have failed a course of conservative therapy, who may be candidates for interventional or surgical treatment, and who have a contraindication to MRI. (Work Group Consensus Statement)

Surgical Treatment:
- Surgical intervention is suggested for the rapid relief of symptoms of cervical radiculopathy from degenerative disorders when compared to medical/interventional treatment. (Grade B - Fair evidence)
- Both anterior cervical discectomy/decompression (ACD) and anterior cervical discectomy/decompression and fusion (ACDF) are suggested as comparable treatment strategies, producing similar clinical outcomes, in the treatment of single level cervical radiculopathy from degenerative disorders. (Grade B – Fair evidence)
- The addition of an interbody graft for fusion is suggested to improve sagittal alignment following ACD. (Grade B – Fair evidence)
- Either ACDF or posterior laminoforaminotomy (PLF) are suggested for the treatment of single level degenerative cervical radiculopathy secondary to foraminal soft disc herniation to achieve comparably successful clinical outcomes. (Grade B – Fair evidence)
- Compared to PLF, ACDF is suggested for the treatment of single level degenerative cervical radiculopathy from central and paracentral nerve root compression and spondylotic disease. (Work Group Consensus Statement)
- Surgery is an option for the treatment of single level degenerative radiculopathy to produce and maintain favorable long term (greater than four year) outcomes. (Grade C – Poor quality evidence)

American College of Occupational and Environmental Medicine (ACOEM) Guideline - 2011
In 2011, the ACOEM issued guidelines on the diagnostic testing and management of cervical and thoracic spine disorders.

MRI received the strongest ACOEM testing recommendation for patients with:
- Acute cervical pain with progressive neurologic deficit
- Significant trauma with no improvement in significantly painful or debilitating symptoms
- A history of neoplasia (cancer)
- Multiple neurological abnormalities that span more than one neurological root level
- Previous neck surgery with increasing neurologic symptoms
- Fever with severe cervical pain
- Symptoms or signs of myelopathy
- Subacute or chronic radicular pain syndromes lasting at least 4 to 6 weeks in whom dermatomal and
myotomal symptoms are not trending towards improvement if either injection is being considered or both the patient and surgeon are considering early surgical treatment if supportive findings on MRI are found

For acute, subacute and chronic cervicothoracic pain, ACOEM “A” (strong) or “B” (moderate) recommendations included strengthening, endurance and aerobic exercises, proton pump inhibitors, sucralfate, acetaminophen/ aspirin, and manipulation/mobilization.

Institute for Clinical and Economic Review (ICER) Evaluation - 2013
In 2013, Washington State Health Care Authority commissioned the ICER to evaluate the comparative clinical effectiveness and comparative value of spinal fusion and its alternatives in patients with cervical degenerative disc disease (DDD).

The focus of this appraisal was on adults (>17 years of age) with cervical DDD symptoms, including neck pain, arm pain, and/or radiculopathic symptoms (e.g., numbness, tingling); these symptoms could occur with or without the presence of spondylosis. In all cases, the target population was focused on patients whose symptoms have persisted despite an initial short course (i.e., 4-6 weeks) of self-care and conservative management.

Evidence was sought to answer several key questions, including:

1. What is the comparative clinical effectiveness of cervical fusion for DDD relative to that of conservative management approaches, minimally-invasive procedures, and other forms of surgery?
ICER conferred a “Comparable” rating spinal fusion vs. conservative management for radiculopathic symptoms. They stated: “For patients with clinical symptoms of radiculopathy and radiographic evidence of nerve root compression there is not a large evidence base comparing outcomes between spinal fusion and conservative management. We identified only 1 RCT and 1 comparative cohort study, neither of which stood out for their methodologic rigor, size, or generalizability. Despite variability in study design, entry criteria, and outcomes measured, findings were reasonably consistent. Specifically, spinal fusion appeared to provide faster relief of pain and symptoms than conservative management (i.e., physical therapy or cervical collar immobilization) in the short term. Over time, however, these differences diminished and no material differences in outcome were observed by 12 months after intervention. ICER cited a Cochrane review by Nikolaidis and colleagues to determine whether surgical treatment of cervical radiculopathy or myelopathy was associated with improved outcome compared with conservative management. Two trials (N = 149) were included. In both trials, allocation concealment was inadequate and arrangements for blinding of outcome assessment were unclear. One trial (81 patients with cervical radiculopathy) found that surgical decompression was superior to physiotherapy or cervical collar immobilization in the short-term for pain, weakness or sensory loss; at one year, there were no significant differences between groups. One trial (68 patients with mild functional deficit associated with cervical myelopathy) found no significant differences between surgery and conservative treatment in three years following treatment. A substantial proportion of cases were lost to follow-up. The authors concluded that it was unclear whether the short-term risks of surgery are offset by long-term benefits. There was low quality evidence that surgery may provide pain relief faster than physiotherapy or hard collar immobilization in patients with cervical radiculopathy; but there is little or no difference in the long-term. There was very low quality evidence that patients with mild myelopathy felt subjectively better shortly after surgery, but there was little or no difference in the long-term.”

“But because of this, and because spinal fusion may cause relatively rare but significant complications, we deemed the overall comparative clinical effectiveness of fusion to conservative management “Comparable”. In some patients, however, neck pain and related symptoms may be so severe and disabling that the faster relief potentially afforded by fusion surgery would also allow a quicker return to work and other normal activities. For such patients, fusion might in fact be considered “Incremental” in comparison to ongoing conservative management”.

Another key question concerned potential harms associated with cervical fusion compared to conservative management:

2. What are the adverse events and other potential harms associated with cervical fusion compared to conservative management approaches, minimally-invasive procedures, and other forms of surgery?
In analyzing data from randomized controlled trials (RCTs) and comparative cohorts, ICER found that the rate of harm and complications from cervical fusion were significantly greater than those from conservative treatment. Some of the highest rates of potential harm from fusion were events of infection (0-13%), adjacent segment
disease (7-16%), paresthesia (14%), dysphagia (3-17%), pseudoarthrosis (8%), and neurological decline (3-23%). Conservative treatment harms were relatively minor, with the exception of neurological decline (14.2%) and paresthesia (8%).

2015 Update
A literature search through July 2015 was performed and there were no studies which would alter the policy statement.

In a meta-analysis, Wu et al. stated that the traditional surgical method of ACDF carries with it the disadvantages of motion loss at the operative level and accelerated adjacent level disc degeneration. They performed a meta-analysis comparing the long-term outcomes of cervical total disc arthroplasty (TDA) versus fusion. This review was prepared following the standard procedures set forth by the Cochrane Collaboration organization, and preferred reporting items for systematic reviews and meta-analyses (PRISMA). The only studies included were randomized controlled trials with a minimum of 4 years of follow-up data. The meta-analysis included the neck disability index (NDI), visual analog scale (VAS) of neck and arm pain, SF-36 physical component scores (SF-36 PCS), over success, neurological success, work status, implant-related complications, and secondary surgery events. Four randomized controlled trials met the inclusion criteria. The long-term improvement of NDI, VAS of neck and arm pain, SF-36 PCS, over success, and neurological success favored the TDA group. The TDA group also had a lower incidence of secondary surgery for both the index level and adjacent level. In this meta-analysis of 4 included RCTs with a minimum 4 years of follow-ups, total disc arthroplasty showed improvements over ACDF as measured by the NDI, VAS of neck and arm pain, and SF-36 PCS.

2016 Update
A literature search through February 2016 was performed and there were no studies which would alter the policy statement.

Adjacent segment disease (ASD) development is known to occur after anterior cervical discectomy and fusion. Bydon and colleagues (2014) retrospectively evaluated 888 individuals treated at a single institution over a 20-year period who underwent ACDF for cervical spondylosis. Of these individuals, 108 had re-do surgery as a result of symptomatic adjacent segment disease (ASD). Individuals were followed for an average of 92.4 ± 52.6 months after the index ACDF. Individuals were more likely to develop ASD, known to occur after ACDF, above the index level of fusion. In agreement with previous ACDF case series, they found the highest rate of cervical spinal degenerative disease requiring surgery was at C5/C6, followed by C6/C7. However, neither the inherent location of the index ACDF nor the length of instrumented arthrodesis appeared to correlate with the propensity to develop ASD.

Summary of Evidence
Literature suggests that spinal fusion appeared to provide faster relief of pain and symptoms than conservative management (i.e., physical therapy or cervical collar immobilization) in the first several months after the surgery. Over time, however, these differences diminished and clinical outcomes of cervical fusion and conservative treatment were comparable at 12 months after the intervention. Additionally, spinal fusion may cause relatively rare but significant complications. Therefore, the first line of treatment for chronic cervical pain should be a comprehensive non-operative approach. A non-emergent cervical spine fusion may be a consideration only after conservative therapy has failed and a physical examination and diagnostic imaging findings indicate neural compression at the appropriate level.

References

Appendix

Table 1. Dermatomes of the Head and Neck

<table>
<thead>
<tr>
<th>Spinal Component</th>
<th>Skin Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisions of the trigeminal nerve (cranial nerve [CN] V1, V2, and V3)</td>
<td>Most of the skin of the face, including anterior aspect of lower jaw (CN V3); the area of skin in front of both ears; superior part of the lateral aspect of the auricle (CN V3)</td>
</tr>
<tr>
<td>Cervical plexus (ventral rami of C2-C4)</td>
<td>Skin over the angle of the mandible, anterior to and behind the ear, the anterior neck and back of the head and neck; inferior part of the lateral aspect of the auricle and skin on medial aspect of the auricle; the lateral and anterior aspects of the neck</td>
</tr>
<tr>
<td>Greater occipital nerve (dorsal ramus of C2), third occipital nerve (dorsal ramus of C3), and the posterior divisions of C4-C6</td>
<td>The posterior aspect of the head (C2) and neck (C3) with C4-C6 innervating the back of the neck</td>
</tr>
</tbody>
</table>
Table 2. Dermatomes of the Upper Extremity

<table>
<thead>
<tr>
<th>Spinal Component</th>
<th>Skin Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third and fourth cervical nerves</td>
<td>Limited area of skin over the root of the neck, upper aspect of the pectoral region, and shoulder</td>
</tr>
<tr>
<td>C5 dermatome</td>
<td>Lateral aspect of the upper extremities at and above the elbow</td>
</tr>
<tr>
<td>C6 dermatome</td>
<td>The forearm and the radial side of the hand</td>
</tr>
<tr>
<td>C7 dermatome</td>
<td>The middle finger</td>
</tr>
<tr>
<td>C8 dermatome</td>
<td>The skin over the small finger and the medial aspect of each hand</td>
</tr>
<tr>
<td>T1 dermatome</td>
<td>The medial side of the forearm</td>
</tr>
<tr>
<td>T2 dermatome</td>
<td>The medial and upper aspect of the arm and the axillary region</td>
</tr>
<tr>
<td>Date</td>
<td>Reason</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>9/08/14</td>
<td>New Policy. Added to UM section. May be considered medically necessary when criteria are met. Policy approved with a hold for provider notification and will be effective December 15, 2014.</td>
</tr>
<tr>
<td>11/04/14</td>
<td>Minor update. Policy title updated; order change in words only for improved clarification.</td>
</tr>
<tr>
<td>12/22/14</td>
<td>Interim review. Policy renumbered; moved from UM section (11.01.505) to Surgery section (7.01.560). Reference #4 removed.</td>
</tr>
<tr>
<td>02/10/15</td>
<td>Interim review. All information specific to posterior cervical removed from policy statement. Title revised to note that criteria apply to anterior cervical decompression and fusion only and to adults only. Definition of corpectomy in Policy Guidelines deleted and definition of cervical radiculopathy expanded. Codes for posterior (22600/22614) deleted.</td>
</tr>
<tr>
<td>05/12/15</td>
<td>Minor update. &quot;With or Without Fusion&quot; removed from title for purposes of clarification. Additional clarifications: the word &quot;cervical&quot; added to multi-level fusion statement and note added that decompression as a stand-alone procedure is not subject to medical review.</td>
</tr>
<tr>
<td>09/08/15</td>
<td>Annual review. Abbreviation “OPLL” added to policy statement for ossification of posterior longitudinal ligament. Dermatome graphics added to Appendix. Rationale updated and reference added. Policy statement revised as noted.</td>
</tr>
<tr>
<td>11/10/15</td>
<td>Interim review. Added Documentation section to Policy Guidelines stating medical necessity is established by submitting documentation of medical history, physical findings, and diagnostic imaging results that demonstrate need for cervical spine surgery. (No documentation guidance was in the policy previously). Policy statements unchanged.</td>
</tr>
<tr>
<td>04/12/16</td>
<td>Annual Review. Policy statement revised: Timeframe for completion of diagnostic imaging changed from 6 months to 12 months, consistent with documentation requirements in Policy Guidelines. Rationale updated and reference added.</td>
</tr>
<tr>
<td>05/24/16</td>
<td>Update Related Policies. Removed 7.01.146 as it was added in error. Replaced with 7.01.551.</td>
</tr>
</tbody>
</table>

Disclaimer: This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. The Company adopts policies after careful review of published peer-reviewed scientific literature, national guidelines and local standards of practice. Since medical technology is constantly changing, the Company reserves the right to review and update policies as appropriate. Member contracts differ in their benefits. Always consult the member benefit booklet or contact a member service representative to determine coverage for a specific medical service or supply. CPT codes, descriptions and materials are copyrighted by the American Medical Association (AMA).
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