Overview

This Coverage Policy addresses orthognathic surgery. Orthognathic surgery is a subset of craniofacial surgery involving the surgical correction of abnormalities of the mandible, maxilla or both.

Coverage Policy

Coverage for orthognathic surgery varies across plans. Refer to the customer’s benefit plan document for coverage details.

The following clinical documentation is required to support medical necessity for orthognathic surgery:

- medical history and physical examination with reference to symptoms related to the orthognathic deformity
- description of specific anatomic deformity present
- lateral and anterior-posterior cephalometric radiographs
- cephalometric tracings
Orthognathic surgery is considered medically necessary when BOTH of the following criteria are met:

- **ANY of the following facial skeletal deformities is present:**
  
  - anteroposterior discrepancies:
    - maxillary/mandibular incisor relationship: overjet of 5 millimeters (mm) or more, or a zero to negative value (norm = 2 mm)
    - maxillary/mandibular anteroposterior molar relationship discrepancy of 4 mm or more (norm = 0-1 mm)
  
  - vertical discrepancies:
    - presence of a vertical facial skeletal deformity which is two or more standard deviations from published norms for accepted skeletal landmarks
    - open bite with no vertical overlap of anterior teeth or unilateral or bilateral posterior open bite greater than 2 mm
    - deep overbite with impingement of palatal soft tissue
    - supraeruption of a dentoalveolar segment resulting from lack of occlusion when dentition in segment is intact
  
  - transverse discrepancies:
    - presence of a transverse skeletal discrepancy which is two or more standard deviations from published norms
    - total bilateral maxillary palatal cusp to mandibular fossa discrepancy of 4 mm or greater, or a unilateral discrepancy of 3 mm or greater, given normal axial inclination of the posterior teeth
  
  - asymmetries:
    - anteroposterior, transverse or lateral asymmetries greater than 3 mm, with concomitant occlusal asymmetry

- **ANY of the following functional impairments is present:**
  
  - persistent difficulties with mastication and swallowing after causes such as neurological or metabolic diseases have been excluded
  
  - malnutrition, significant weight loss, or failure-to-thrive secondary to facial skeletal deformity
  
  - speech dysfunction directly related to a jaw deformity as determined by a speech and language pathologist
  
  - myofascial pain secondary to facial skeletal deformity that has persisted for at least six months, despite conservative treatment such as physical therapy and splints

Please note: Computer-assisted technologies, including computerized tomography guided planning procedures and three-dimensional virtual treatment planning, are considered integral to the primary procedure when performed as part of orthognathic surgery.

Note: Please reference Cigna Medical Coverage policy “Surgical Treatments for Obstructive Sleep Apnea” for conditions of coverage related to maxillomandibular advancement for the treatment of obstructive sleep apnea (OSA).

**Not Covered**

Surgical procedures such as rhinoplasty, genioplasty or rhytidectomy performed in conjunction with orthognathic surgery for the sole purpose of improving individual appearance and profile are considered cosmetic in nature and not medically necessary.
General Background

Orthognathic surgery is performed to correct abnormalities of the mandible, maxilla or both. Dentofacial abnormalities may be congenital resulting from genetic and/or environmental influences that impact fetal growth between the 20th and 50th day of gestation. Additionally, dentofacial anomalies may be evident at birth or they may emerge during growth and development. Jaw deformities may result from acquired defects, neoplastic processes, or degenerative diseases.

Jaw Deformities

Jaw deformities include abnormalities of jaw-to-jaw size and shape and may include excessive or deficient bone-to-bone or bone-to-soft-tissue relationships. Deformities may be present in any of the three planes: horizontal, vertical or transverse, or a combination of these.

In a position paper issued in 1988, the American Association of Oral and Maxillofacial Surgeons (AAOMS) classified dentofacial deformities as mid-face or mandibular, as follows:

- skeletal deformities of the mid-face
  - maxillary hyperplasia
  - maxillary hypoplasia
  - cleft deformities
  - other mid-face deformities, including nasal, zygomatic, orbital, ethmoidal, frontal or other cranial bones
- skeletal deformities of the mandible
  - mandibular hyperplasia
  - mandibular hypoplasia
  - mandibular asymmetry
  - condylar abnormalities, including hypoplasia, hyperplasia, neoplasia, ankylosis, post-traumatic conditions, and agenesis

The relationship between facial skeletal abnormalities and malocclusion is generally accepted. A strong correlation has been established between the state of a patient’s occlusion and chewing efficiency, bite forces, and restricted mandibular excursions. Other signs of dysfunction related to facial skeletal abnormalities, such as obstructive sleep apnea, may also be present. Orthognathic surgery may be performed to improve function by correcting the underlying skeletal deformity when dental/orthodontic treatment alone is precluded due to the severity of deformities and related impairment.

Dental Occlusion/Malocclusion

The classification of dental occlusions is based on Edward Angle’s early observations that the key to occlusion is the relationship of the mandibular first molar to the maxillary first molar. Angle’s occlusal classifications are as follows (Liang and Naran, 2019; Patel, 2018):

- **Class I (neutro-occlusion):** The mesiobuccal cusp of the maxillary first molar articulates within the mesiobuccal groove of the mandibular first molar.
- **Class II (disto-occlusion):** The mandibular first molar articulates distal to the mesiobuccal cusp of the maxillary first molar. This may be due to a deficiency of the lower jaw or excess of the upper jaw, and is, therefore, categorized into two divisions. In Division I, the mandibular arch is behind the upper jaw with protrusion of the upper front teeth, while in Division II the mandibular teeth are behind the upper teeth, with a retrusion of the maxillary front teeth.
- **Class III (mesio-occlusion):** The mesiobuccal groove of the mandibular first molar is mesial to the mesiobuccal cusp of the maxillary first molar. This occlusion usually produces a strong protruding chin, due to either horizontal mandibular excess or horizontal maxillary deficiency.

The terms Class I, II, and III are also used to define the maxillary and mandibular canine relation. The above classification relates only to maxillary/mandibular dentition. Although it is often assumed that a similar skeletal
relationship of Class I, II, and III follows, this is not always the case. A Class I molar relationship is possible with a Class II skeletal relationship by dental extractions and orthodontic alignment regardless of skeletal status (Liang and Naran, 2019; Patel, 2018).

Surgical Procedures
In orthognathic surgery, an osteotomy is made in the affected jaw, and the bones are repositioned in a more normal alignment. The bones are held in position with plates, screws and/or wires. Intermaxillary fixation, a procedure in which arch bars are placed on both jaws, may also be needed to provide added stability. Simultaneous osteotomies may be performed when deformities must be corrected in both jaws. Grafts from the ribs, hip or skull may be performed for patients with deficient bone tissue; alloplastic bone replacement may also be required. Orthognathic surgery is generally performed under general anesthesia on an inpatient basis. Although sometimes performed for cosmetic purposes, orthognathic surgery is generally considered to be medically necessary when performed to treat a significant abnormality that is causing considerable functional impairment. Functional impairments include (AAOMS, 2020; Brooks and Boyd, 2018):

- persistent inability to masticate and swallow food adequately when other causes such as neurological or metabolic diseases have been ruled out by physical exam and/or appropriate diagnostic testing
- malnutrition, significant weight loss, or failure to thrive
- speech and articulation disorders directly related to jaw deformity, as determined by a speech and language pathologist
- myofascial pain that has persisted for at least six months, despite conservative treatment, such as physical therapy
- airway obstruction, such as obstructive sleep apnea, when documented by sleep study when:
  - conservative treatment (e.g., continuous positive airway pressure [CPAP], oral appliance) has been attempted and failed despite patient compliance
  - the patient has failed prior less invasive surgical procedures or has craniofacial skeletal abnormalities that are associated with a narrowed posterior airway space and tongue-base obstruction

Patients with bone or soft tissue deficiency of the face may require distraction osteogenesis. In this procedure, a distraction device is applied to the bone, and a controlled fracture is created and gradually separated, allowing new bone formation in the distracted segments. This allows the facial bone and adjacent soft tissue to elongate.

Orthognathic surgery involves complex three-dimensional movements of the maxilla and mandible, and thus the preoperative workup is extensive. Along with a complete history and physical exam, thorough skeletal, soft tissue, and dental analyses are also undertaken. High-quality standardized photographs may be necessary for documentation and treatment planning. Ideally these include intraoral views, frontal views at rest and at full smile, left and right lateral views, and left and right three-quarter views. Additional views such as bird’s eye or worm’s eye views may be indicated in select patients (e.g. an individual with cleft lip or palate) (Oh and Oishi, 2018). Preoperative imaging may include a panorex, posteroanterior cephalometric, and lateral cephalometric radiographs; cone beam computed tomography (CT) may also be performed. All key anatomical landmarks, measurements, and cephalometric tracings are documented to facilitate diagnosis and treatment planning. Dental models (molds/casts) are created. Typically, if a single jaw surgery is planned, only one set of impressions for the maxilla and mandible is necessary. If a double jaw and/or more complex surgery is planned, additional impressions may be required (Oh and Oishi, 2018). Model surgery is then performed on the casts to simulate the cuts and repositioning to be performed in the actual surgery. Once repositioned, the dental casts are then secured in their new position and an occlusal splint is created that will be used intraoperatively to place the maxilla and the mandible into the planned final occlusion prior to the application of rigid fixation (Liang and Naran, 2019).

Intraoperative complications of orthognathic surgery, while relatively rare, may include bleeding, bad splits/segment fractures, and dental injuries. The prevalence of postoperative complications is also relatively low, and may include infection, neurologic injury, bad splits, relapse of the condition, and temporomandibular disorder (Olate, et al., 2018; Kim, 2017). In a retrospective analysis of 16,515 orthognathic surgery patients, Metalwala et al. (2018) noted that patients with more severe presentations (i.e., clefts or craniofacial anomalies) were at
higher risk for postoperative infection (7.4% compared to 0.6% of patients without a craniofacial anomaly), as well as increased length of hospital stay, and higher hospital charges.

Computer-assisted techniques associated with orthognathic surgery, which includes surgical planning, simulation, and intraoperative translation of virtual surgery, have been reported on in the literature (Huang, et al., 2019; Zhang, et al., 2016; Lin, et al., 2015; Swennen, et al., 2009). Most recently, three-dimensional virtual surgical planning of orthognathic surgery, which includes three-dimensional printing of surgical templates and models which are then transferred into the actual operative setting, has been recommended to increase efficiency and accuracy of the surgical reconstruction. However, when performed as part of orthognathic surgery computer-assisted technologies including virtual surgical planning, three-dimensional imaging, and/or computerized tomography scans, are considered integral to the primary surgical procedure.

Peck et al. (2021) observed that, compared to white patients, orthognathic surgery complications were increased among Hispanic patients treated for malocclusion (2.1% versus 1.3%, p=0.037), and for other (non-Black/white/Hispanic/Asian/Pacific Islander) patients treated for apnea (8.7% vs 0.83%, p=0.002). Hospital length of stay was increased in both Black patients (3.3 versus 2.1 days, p<0.001) and Hispanic patients (2.9 days, p<0.001). Hospital costs were higher than whites ($35,633.47) among Hispanic patients ($48,029.15, p<0.001), Black patients ($47,034.41, p<0.001), and Asian/Pacific Islander patients ($44,192.49, p<0.001). The authors hypothesized that lower utilization of preoperative dental and orthodontic care (potentially related to systemic and financial factors) may predispose more complex surgeries among non-white patients, requiring larger sagittal advancements and increasing both costs and hospital length of stay. Additionally, those same systemic factors may influence comorbidity, the type and quality of hospital care, and various elements of recovery and discharge. The authors concluded that the observed disparities are likely due to nuanced and complex relationships of a combination of factors both prior to and during hospitalization.

Other Procedures: Procedures such as rhinoplasty, genioplasty or rhytidectomy may be performed in conjunction with orthognathic surgery. Procedures performed with the primary purpose of improving physical appearance or to treat psychological symptomatology or psychosocial complaints are cosmetic in nature and not medically necessary.

U.S. Food and Drug Administration (FDA)
The FDA has granted 510(k) (Class II) approval to several implantable bone plate systems used in orthognathic surgery, such as the CranioMaxillofacial Fixation (CMF) System (Visionare LLC, San Diego, CA, 2018); the Frontier Devices Maxillofacial, Orthognathic, Mandible Reconstruction and Mesh Systems (Frontier Devices, Pelham, AL, 2010); and the Ortrautek Orthognathic System (Tekka, Bethesda, MD, 2003).

Professional Societies/Organizations
American Association of Oral and Maxillofacial Surgeons (AAOMS): The AAOMS Criteria for Orthognathic Surgery (2020) have become widely adopted as a tool to assist in determining whether orthognathic surgery is medically indicated. As listed below, these maxillary and/or mandibular facial skeletal deformities associated with masticatory malocclusion relate verifiable clinical measurements to significant facial skeletal deformities:

- **anteroposterior discrepancies:**
  - maxillary/mandibular incisor relationship: overjet of 5 mm or more*; or a zero to negative value* (norm = 2 mm)
  - maxillary/mandibular anteroposterior molar relationship discrepancy of 4 mm or more* (norm = 0–1 mm)
  *These values represent two or more standard deviations from published norms.
- **vertical discrepancies:**
  - presence of a vertical facial skeletal deformity which is two or more standard deviations from published norms for accepted skeletal landmarks
  - open bite:
    - no vertical overlap of anterior teeth
    - unilateral or bilateral posterior open bite greater than 2 mm
  - deep overbite with impingement or irritation of buccal or lingual soft tissues of the opposing arch
  - supraeruption of a dentoalveolar segment due to lack of occlusion
transverse discrepancies:
- presence of a transverse skeletal discrepancy which is two or more standard deviations from published norms
- total bilateral maxillary palatal cusp to mandibular fossa discrepancy of 4 mm or greater, or a unilateral discrepancy of 3 mm or greater, given normal axial inclination of the posterior teeth

asymmetries:
- anteroposterior, transverse or lateral asymmetries greater than 3 mm, with concomitant occlusal asymmetry

In addition to the above conditions, the AAOMS states that orthognathic surgery may be indicated in cases where there are specific documented signs of dysfunction. These may include conditions involving:

- Facial skeletal discrepancies associated with documented sleep apnea, airway defects, and soft tissue discrepancies
  - Before surgery, such patients should be properly evaluated to determine the cause and site of their disorder with appropriate non-surgical treatment attempted when indicated.

- Facial skeletal discrepancies associated with documented temporomandibular joint pathology
  - Prior to performing an orthognathic procedure on such patients, non-surgical therapies should be attempted, including those procedures and treatments that mimic the effects of occlusal alteration.

- Facial skeletal discrepancies associated with documented psychological disorders
  - Prior to surgical treatment designed primarily to improve psychological conditions, appropriate consultation should be obtained and non-surgical therapy attempted when reasonable.

- Facial skeletal discrepancies associated with documented speech impairments
  - Prior to surgery, speech evaluation should be obtained to demonstrate the nature of the problem and to determine if improvement can be expected.

Use Outside of the US
No relevant information.

Medicare Coverage Determinations

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Policy Name/Number</th>
<th>Revision Effective Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCD</td>
<td>No National Coverage Determination found</td>
<td></td>
</tr>
<tr>
<td>LCD</td>
<td>Palmetto GBA</td>
<td>Cosmetic and Reconstructive Surgery (L33428) 7/29/2021</td>
</tr>
<tr>
<td>LCD</td>
<td>Wisconsin Physicians Service Insurance Corp.</td>
<td>Surgical Treatment of Obstructive Sleep Apnea (OSA) (L34526) 7/29/2021</td>
</tr>
</tbody>
</table>

Note: Please review the current Medicare Policy for the most up-to-date information.

Coding/Billing Information

Note: 1) This list of codes may not be all-inclusive.

2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:
<table>
<thead>
<tr>
<th>CPT® Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21110</td>
<td>Application of interdental fixation device for conditions other than fracture or dislocation, includes removal</td>
</tr>
<tr>
<td>21125</td>
<td>Augmentation, mandibular body or angle; prosthetic material</td>
</tr>
<tr>
<td>21127</td>
<td>Augmentation, mandibular body or angle; with bone graft, onlay or interpositional (includes obtaining autograft)</td>
</tr>
<tr>
<td>21141</td>
<td>Reconstruction midface, LeFort I; single piece, segment movement in any direction (eg, for Long Face Syndrome), without bone graft</td>
</tr>
<tr>
<td>21142</td>
<td>Reconstruction midface, LeFort I; 2 pieces, segment movement in any direction, without bone graft</td>
</tr>
<tr>
<td>21143</td>
<td>Reconstruction midface, LeFort I; 3 or more pieces, segment movement in any direction, without bone graft</td>
</tr>
<tr>
<td>21145</td>
<td>Reconstruction midface, LeFort I; single piece, segment movement in any direction, requiring bone grafts (includes obtaining autografts)</td>
</tr>
<tr>
<td>21146</td>
<td>Reconstruction midface, LeFort I; 2 pieces, segment movement in any direction, requiring bone grafts (includes obtaining autografts) (eg, ungrafted unilateral alveolar cleft)</td>
</tr>
<tr>
<td>21147</td>
<td>Reconstruction midface, LeFort I; 3 or more pieces, segment movement in any direction, requiring bone grafts (includes obtaining autografts) (eg, ungrafted bilateral alveolar cleft or multiple osteotomies)</td>
</tr>
<tr>
<td>21150</td>
<td>Reconstruction midface, LeFort II; anterior intrusion (eg, Treacher-Collins Syndrome)</td>
</tr>
<tr>
<td>21151</td>
<td>Reconstruction midface, LeFort II; any direction, requiring bone grafts (includes obtaining autografts)</td>
</tr>
<tr>
<td>21154</td>
<td>Reconstruction midface, LeFort III (extracranial), any type, requiring bone grafts (includes obtaining autografts); without LeFort I</td>
</tr>
<tr>
<td>21155</td>
<td>Reconstruction midface, LeFort III (extracranial), any type, requiring bone grafts (includes obtaining autografts); with LeFort I</td>
</tr>
<tr>
<td>21159</td>
<td>Reconstruction midface, LeFort III (extra and intracranial) with forehead advancement (eg, mono bloc), requiring bone grafts (includes obtaining autografts); without LeFort I</td>
</tr>
<tr>
<td>21160</td>
<td>Reconstruction midface, LeFort III (extra and intracranial) with forehead advancement (eg, mono bloc), requiring bone grafts (includes obtaining autografts); with LeFort I</td>
</tr>
<tr>
<td>21188</td>
<td>Reconstruction midface, osteotomies (other than LeFort type) and bone grafts (includes obtaining autografts)</td>
</tr>
<tr>
<td>21193</td>
<td>Reconstruction of mandible rami, horizontal, vertical, C, or L osteotomy; without bone graft</td>
</tr>
<tr>
<td>21194</td>
<td>Reconstruction of mandible rami, horizontal, vertical, C, or L osteotomy; with bone graft (includes obtaining graft)</td>
</tr>
<tr>
<td>21195</td>
<td>Reconstruction of mandibular rami and/or body, sagittal split; without internal rigid fixation</td>
</tr>
<tr>
<td>21196</td>
<td>Reconstruction of mandibular rami and/or body, sagittal split; with internal rigid fixation</td>
</tr>
<tr>
<td>21198</td>
<td>Osteotomy, mandible, segmental;</td>
</tr>
<tr>
<td>21206</td>
<td>Osteotomy, maxilla, segmental (eg, Wassmund or Schuchard)</td>
</tr>
<tr>
<td>21208</td>
<td>Osteoplasty, facial bones; augmentation (autograft, allograft, or prosthetic implant)</td>
</tr>
<tr>
<td>21209</td>
<td>Osteoplasty, facial bones; reduction</td>
</tr>
<tr>
<td>21210</td>
<td>Graft, bone; nasal, maxillary or malar areas (includes obtaining graft)</td>
</tr>
<tr>
<td>21215</td>
<td>Graft, bone; mandible (includes obtaining graft)</td>
</tr>
<tr>
<td>21247</td>
<td>Reconstruction of mandibular condyle with bone and cartilage autografts (includes obtaining grafts) (eg, for hemifacial microsoma)</td>
</tr>
</tbody>
</table>


**References**


