Medical Policy
Bone Morphogenetic Protein

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• Policy: Medicare
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Policy Number: 097
BCBSA Reference Number: 7.01.100 (For Plan internal use only)
NCD/LCD: N/A

Related Policies
• Ultrasound Accelerated Fracture Healing Device, #497
• Electrical Bone Growth Stimulation of the Appendicular Skeleton, #499
• Electrical Stimulation of the Spine as an Adjunct to Spinal Fusion Procedures, #498

Policy
Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity
Medicare HMO BlueSM and Medicare PPO BlueSM Members

Use of recombinant human bone morphogenetic protein-2 (rhBMP-2; Infuse®) may be considered MEDICALLY NECESSARY in skeletally mature individuals:
• For anterior lumbar interbody fusion procedures when the use of autograft is not feasible.*
• For instrumented posterolateral intertransverse spinal fusion procedures when the use of autograft is not feasible.*
• For the treatment of acute, open fracture of the tibial shaft, when the use of autograft is not feasible.*

Use of recombinant human bone morphogenetic protein (rhBMP-2) is considered INVESTIGATIONAL for all other indications, including but not limited to spinal fusion when the use of autograft is feasible and craniomaxillofacial surgery.

*Use of iliac crest bone graft may be considered not feasible due to situations that may include, but are not limited to, prior harvesting of iliac crest bone graft or need for a greater quantity of iliac crest bone graft than available (eg, for multilevel fusion).

Recombinant Human Bone Morphogenetic Protein Products and Associated Carrier and Delivery Systems Approved by U.S. Food and Drug Administration
INFUSE™ Bone Graft/LT-CAGE™ Lumbar Tapered Fusion Device
• Extension of device use from L2 to S1
• May be used with retrolisthesis
INFUSE™ Bone Graft/LT-CAGE™ Lumbar Tapered Fusion Device
- Indicated for acute, open tibial shaft fractures stabilized with nail fixation
- Alternative to autogenous bone graft for sinus augmentations
- For localized alveolar ridge augmentations in extraction socket defects

INFUSE™ Bone Graft/Medtronic Interbody Fusion Device (Marketing name change)
- Expanded indication for 2 additional interbody fusion devices
- Perimeter Interbody Fusion Device implanted via retroperitoneal ALIF L2 to S1 or OLIF L5 to S1
- Clydesdale Spinal System implanted via OLIF at single level from L2-S5

INFUSE™ Bone Graft/Medtronic Interbody Fusion Device
- Expanded indication for 2 additional interbody fusion devices
- Divergence-L Anterior/Oblique Lumbar Fusion System
- Pivox™ Oblique Lateral Spinal System

Prior Authorization Information

Inpatient
- For services described in this policy, precertification/preauthorization is required for all products if the procedure is performed inpatient.

Outpatient
- For services described in this policy, see below for products where prior authorization might be required if the procedure is performed outpatient.

<table>
<thead>
<tr>
<th>Product</th>
<th>Prior Authorization Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Managed Care (HMO and POS)</td>
<td>Prior authorization is required.</td>
</tr>
<tr>
<td>Commercial PPO</td>
<td>Prior authorization is required.</td>
</tr>
<tr>
<td>Medicare HMO BlueSM</td>
<td>Prior authorization is required.</td>
</tr>
<tr>
<td>Medicare PPO BlueSM</td>
<td>Prior authorization is required.</td>
</tr>
</tbody>
</table>

CPT Codes / HCPCS Codes / ICD Codes

Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member’s contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue:

CPT Codes

<table>
<thead>
<tr>
<th>CPT codes:</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20930</td>
<td>Allograft, morselized, or placement of osteopromotive material, for spine surgery only (Report in addition to the primary spinal fusion procedure)</td>
</tr>
</tbody>
</table>

ICD-10 Procedure Codes
**ICD-10-PCS procedure codes:**

<table>
<thead>
<tr>
<th>Code Description</th>
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<tbody>
<tr>
<td>3E0V0GB</td>
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</table>

**Description**

**Bone Morphogenetic Protein and Carrier and Delivery Systems**

Bone morphogenetic proteins are members of the transforming growth factors family. At present, some 20 bone morphogenetic proteins have been identified, all with varying degrees of tissue-stimulating properties.

The recombinant human bone morphogenetic proteins (rhBMPs) are delivered to the bone grafting site as part of a surgical procedure; a variety of carrier and delivery systems has been investigated. Carrier systems, which are absorbed over time, maintain the concentration of the rhBMP at the treatment site, provide temporary scaffolding for osteogenesis, and prevent extraneous bone formation. Carrier systems have included inorganic material, synthetic polymers, natural polymers, and bone allograft. The rhBMP and carrier may be inserted via a delivery system, which may also provide mechanical support.

**Applications**

The carrier and delivery system are important variables in the clinical use of rhBMPs, and different clinical applications (eg, long-bone nonunion, interbody or intertransverse fusion) have been evaluated with different carriers and delivery systems. For example, rhBMP putty with pedicle and screw devices are used for instrumented intertransverse fusion (posterolateral fusion), while rhBMP in a collagen sponge with bone dowels or interbody cages are used for interbody spinal fusion. Also, interbody fusion of the lumbar spine can be approached from an anterior (anterior lumbar interbody fusion), lateral, or posterior direction (posterior lumbar interbody fusion or transforaminal lumbar interbody fusion; see Appendix). Surgical procedures may include decompression of the spinal canal and insertion of pedicle screws and rods to increase the stability of the spine.

Posterior approaches (eg, posterior lumbar interbody fusion, transforaminal lumbar interbody fusion) allow decompression (via laminotomies and facetectomies) for treatment of spinal canal pathology (eg, spinal stenosis, lateral recess and foraminal stenosis, synovial cysts, hypertrophic ligamentum flavum) along with spine stabilization. Such approaches are differentiated from instrumented or noninstrumented posterolateral fusion, which involves the transverse processes. Due to the proximity of these procedures to the spinal canal, risks associated with ectopic bone formation are increased (eg, radiculopathies). Increased risk of bone resorption around rhBMP grafts, heterotopic bone formation, epidural cyst formation, and seromas have also been postulated.

**Summary**

**Description**

Two recombinant human bone morphogenetic proteins (rhBMPs) have been extensively studied: recombinant human bone morphogenetic protein-2 (rhBMP-2), applied with an absorbable collagen sponge (Infuse), and recombinant human bone morphogenetic protein-7 (rhBMP-7), applied in putty (OP-1; not currently available in the U.S.). These protein products have been investigated as alternatives to bone autografting in a variety of clinical situations, including spinal fusions, internal fixation of fractures, treatment of bone defects, and reconstruction of maxillofacial conditions.

**Summary of Evidence**

For individuals who are undergoing anterior or posterolateral lumbar spinal fusion and in whom autograft is not feasible who receive recombinant human bone morphogenetic proteins (rhBMPs), the evidence includes randomized controlled trials (RCTs), systematic reviews, and meta-analyses. Relevant outcomes are symptoms, morbid events, functional outcomes, and treatment-related morbidity. In 2013, 2 systematic reviews of recombinant human bone morphogenetic protein-2 (rhBMP-2) trials using manufacturer-provided individual patient-level data were published. Overall, these reviews found little to no benefit of rhBMP-2 over iliac crest bone graft for all patients undergoing spinal fusion, with an
uncertain risk of harm. The small benefits reported do not support the widespread use of rhBMP-2 as an alternative to iliac crest autograft. However, the studies do establish that rhBMP-2 has efficacy in promoting bone fusion and will improve outcomes for patients for whom use of iliac crest bone graft is not feasible. The overall adverse event rate was low, though concerns remain about increased adverse event rates with rhBMP-2, including cancer. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who are undergoing surgery for acute tibial shaft fracture and in whom autograft is not feasible who receive rhBMP, the evidence includes RCTs and systematic reviews of the RCTs. Relevant outcomes are symptoms, morbid events, functional outcomes, and treatment-related morbidity. Two systematic reviews have concluded that rhBMP can reduce reoperations rates compared with soft-tissue management with or without intramedullary nailing. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals undergoing other surgical procedures (eg, oral and maxillofacial, hip arthroplasty, distraction osteogenesis) who receive rhBMP, the evidence includes a health technology assessment, systematic review, clinical trials, and small case series. Relevant outcomes are symptoms, morbid events, functional outcomes, and treatment-related morbidity. The evidence generally shows that rhBMP may not be as effective as a bone graft approach in craniofacial surgery; however, its use is associated with fewer adverse events. The evidence does not permit conclusions about the effect of rhBMP for tibial shaft fracture nonunion. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

### Policy History

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
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<tbody>
<tr>
<td>4/2023</td>
<td>Annual policy review. Policy statement updated to note that the use of recombinant human bone morphogenetic protein-2 is considered investigational (instead of &quot;not medically necessary&quot;) for all other indications, including but not limited to spinal fusion when the use of autograft is feasible and craniofacial surgery.</td>
</tr>
<tr>
<td>4/2023</td>
<td>Policy clarified to include guidelines when the use of autograft is not feasible.</td>
</tr>
<tr>
<td>8/2022</td>
<td>Policy clarified. FDA-approved INFUSE™ products added. Policy statements unchanged.</td>
</tr>
<tr>
<td>6/2022</td>
<td>Annual policy review. Description, summary, and references updated. Policy statements unchanged.</td>
</tr>
<tr>
<td>5/2021</td>
<td>Annual policy review. Description, summary, and references updated. Policy statements unchanged.</td>
</tr>
<tr>
<td>3/2018</td>
<td>Annual policy review. The term “unfeasible” clarified to “not feasible” in the medically necessary statement. The not medically necessary statement was revised to add craniofacial surgery. Clarified coding information. Effective 3/1/2018.</td>
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<tr>
<td>9/2016</td>
<td>Annual policy review. FDA approval for rhBMP-2 in oblique lateral interbody fusion added; rhBMP-7 removed from policy statements. Effective 9/1/2016.</td>
</tr>
<tr>
<td>9/2015</td>
<td>Added coding language.</td>
</tr>
<tr>
<td>12/2014</td>
<td>Annual policy review. New references added.</td>
</tr>
<tr>
<td>5/2014</td>
<td>Updated Coding section with ICD10 procedure and diagnosis codes, effective 10/2015.</td>
</tr>
<tr>
<td>4/2014</td>
<td>Annual policy review. One FDA-approved indication that had been omitted re-inserted: treatment of tibial shaft with BMP-2 (when autograft is unfeasible added); return to use of FDA language regarding treatment of noninstrumented revision</td>
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<tr>
<td>Date</td>
<td>Event</td>
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<td>----------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1/2014</td>
<td>Coding information clarified</td>
</tr>
<tr>
<td>12/2010</td>
<td>Annual policy review. No changes to policy statements.</td>
</tr>
<tr>
<td>1/2010</td>
<td>Annual policy review. Covered indications for bone morphogenetic protein-2 clarified; bone morphogenetic protein-7 is now covered based on the indications in this policy. Effective 2/1/2010.</td>
</tr>
<tr>
<td>7/2009</td>
<td>Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine, and Rheumatology. No changes to policy statements.</td>
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### Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:
- [Medical Policy Terms of Use](#)
- [Managed Care Guidelines](#)
- [Indemnity/PPO Guidelines](#)
- [Clinical Exception Process](#)
- [Medical Technology Assessment Guidelines](#)

### References


