Medical Policy
Progenitor Cell Therapy for the Treatment of Damaged Myocardium Due to Ischemia

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Policy Number: 652
BCBSA Reference Number: 2.02.18

Related Policies
- Orthopedic Applications of Stem-Cell Therapy, #254
- Stem-cell Therapy for Peripheral Arterial Disease, #348

Policy

**Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity**

*Medicare HMO BlueSM and Medicare PPO BlueSM Members*

Progenitor cell therapy, including but not limited to, skeletal myoblasts or hematopoietic stem cells, is **INVESTIGATIONAL** as a treatment of damaged myocardium.

Infusion of growth factors (i.e., granulocyte colony stimulating factor [GCSF]) is **INVESTIGATIONAL** as a technique to increase the numbers of circulating hematopoietic stem cells as treatment of damaged myocardium.

**Prior Authorization Information**

Pre-service approval is required for all inpatient services for all products.

See below for situations where prior authorization may be required or may not be required for outpatient services.

Yes indicates that prior authorization is required.

No indicates that prior authorization is not required.

N/A indicates that this service is primarily performed in an inpatient setting.

<table>
<thead>
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<th>Outpatient</th>
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<td>Commercial Managed Care (HMO and POS)</td>
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<td>Medicare PPO BlueSM</td>
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The following codes are included below for informational purposes. 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.

CPT Codes
There is no specific CPT code for this service.

Description
Ischemia is the most common cause of cardiovascular disease and myocardial damage in the developed world. Despite impressive advances in treatment, ischemic heart disease is still associated with high morbidity and mortality. Current treatments for ischemic heart disease seek to revascularize occluded arteries, optimize pump function, and prevent future myocardial damage. However, current treatments are not able to reverse existing damage to heart muscle.

Treatment with progenitor cells (i.e., stem cells) offers potential benefits beyond those of standard medical care, including the potential for repair and/or regeneration of damaged myocardium. The potential sources of embryonic and adult donor cells include skeletal myoblasts, bone marrow cells, circulating blood-derived progenitor cells, endometrial mesenchymal stem cells (MSCs), adult testis pluripotent stem cells, mesothelial cells, adipose-derived stromal cells, embryonic cells, induced pluripotent stem cells, and bone marrow MSCs, all of which are able to differentiate into cardiomyocytes and vascular endothelial cells.

The mechanism of benefit following treatment with progenitor cells is not entirely understood. It has also been proposed that progenitor cells may improve perfusion to areas of ischemic myocardium. Basic science research also suggests that injected stem cells secrete cytokines with anti-apoptotic and pro-angiogenesis properties. Clinical benefit may result if these paracrine factors are successful at limiting cell death from ischemia or stimulating recovery. For example, myocardial protection can occur through modulation of inflammatory and fibrogenic process. Alternatively, paracrine factors might affect intrinsic repair mechanisms of the heart through neovascularization, cardiac metabolism and contractility, increase in cardiomyocyte proliferation, or activation of resident stem and progenitor cells. The relative importance of these proposed paracrine actions will depend on the age of the infarct, e.g., cytoprotective effects with acute ischemia versus cell proliferation with chronic ischemia. Investigation of the specific factors that are induced by administration of progenitor cells is ongoing.

Examples of stem cell therapy products for the treatment of damaged myocardium include MyoCell™ from BioHeart, Inc. and Prochymal® from Osiris Therapeutics, Inc. All stem cell therapy products for the treatment of damaged myocardium are considered investigational regardless of the commercial name, the manufacturer or FDA approval status.

Summary
Progenitor cell therapy for the treatment of damaged myocardium is a rapidly evolving field, with a number of areas of substantial uncertainty including patient selection, cell type, and procedural details (e.g., timing and mode of delivery).

For acute ischemic heart disease, the limited evidence on clinical outcomes suggests that there may be benefits in improving LVEF, reducing recurrent MI, decreasing the need for further revascularization, and perhaps even decreasing mortality. These results indicate that progenitor cell treatment is a promising therapy with the potential to benefit a large population of patients with ischemic heart disease. However, the evidence to date should be viewed as preliminary rather than definitive. There are numerous reasons
why the confidence in these conclusions is not high. The primary limitation is the small quantity of
evidence on clinical outcomes, with limited evidence across all trials on outcomes such as recurrent MI
and death. While the evidence for a beneficial impact on physiologic outcomes, particularly LVEF, is fairly
strong, the magnitude of effect does not appear to be large. As a result, it is not certain whether the
improvement in LVEF translates to meaningful improvements in clinical outcomes.

For chronic ischemic heart disease, there is limited evidence on clinical outcomes. Only a handful of
clinical outcome events have been reported across the included studies, too few for meaningful analysis.
Other clinical outcomes, such as NYHA class, are confined to very small numbers of patients and not
reported with sufficient methodologic rigor to permit conclusions. Therefore, the evidence is insufficient to
permit conclusions on the impact of progenitor cell therapy on clinical outcomes for patients with chronic
ischemic heart disease.

Overall, the new evidence corroborates previous studies in demonstrating an improvement in LVEF and
myocardial perfusion for patients with myocardial ischemia treated with progenitor cells. The clinical
significance of the improvement in these parameters has yet to be demonstrated, and there is very little
evidence demonstrating a benefit in clinical outcome. Moreover, the evidence remains primarily limited to
short-term effects; the long-term durability of benefit has not yet been determined. Therefore, progenitor
(stem) cell therapy for the treatment of damaged myocardium is considered investigational.

**Policy History**

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No changes to policy statements.

Changes to policy statements.

No changes to policy statements.

No changes to policy statements.

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