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

Table of Contents
- Policy: Commercial
- Policy: Medicare
- Authorization Information
- Coding Information
- Description
- Information Pertaining to All Policies
- Policy History
- References

Policy Number: 652
BCBSA Reference Number: 2.02.18
NCD/LCD: NA

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.

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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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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