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Original Effective Date: 06/15/00

Reviewed: 04/25/24

Revised: 05/15/24

Subject: Transmyocardial Revascularization (TMR)

THIS MEDICAL COVERAGE GUIDELINE IS NOT AN AUTHORIZATION, CERTIFICATION, EXPLANATION OF BENEFITS, OR A GUARANTEE OF PAYMENT, NOR DOES IT SUBSTITUTE FOR OR CONSTITUTE MEDICAL ADVICE. ALL MEDICAL DECISIONS ARE SOLELY THE RESPONSIBILITY OF THE PATIENT AND PHYSICIAN. BENEFITS ARE DETERMINED BY THE GROUP CONTRACT, MEMBER BENEFIT BOOKLET, AND/OR INDIVIDUAL SUBSCRIBER CERTIFICATE IN EFFECT AT THE TIME SERVICES WERE RENDERED. THIS MEDICAL COVERAGE GUIDELINE APPLIES TO ALL LINES OF BUSINESS UNLESS OTHERWISE NOTED IN THE PROGRAM EXCEPTIONS SECTION.

DESCRIPTION:

Transmyocardial revascularization (TMR), also known as transmyocardial laser revascularization, is a surgical technique that attempts to improve blood flow to ischemic heart muscles by creating direct channels from the left ventricle into the myocardium. TMR may be performed via a thoracotomy or percutaneous TMR (PTMR).The patient is under general anesthesia for a TMR performed via a thoracotomy. Cardiopulmonary bypass is not required. A laser probe is placed on the surface of the myocardium, and while the heart is in diastole, the laser is discharged to create a channel through the myocardium into the left ventricle.

PTMR (also called percutaneous myocardial channeling) is a catheter-based system using holmium:YAG laser revascularization under fluoroscopic guidance. Although less invasive than TMR, PTMR has potential disadvantages. To minimize the risks of cardiac tamponade, a potentially fatal condition in which the pericardium fills with blood, the myocardial channels created by PTMR are not as deep as those made by TMR. Also, positioning the laser under fluoroscopic guidance is less precise than the direct visual control of TMR. Less invasive (eg, robotic) techniques for use of this procedure are also being studied.

POSITION STATEMENT:

Transmyocardial laser revascularization **meets the definition of medical necessity** for members with class III or IV angina, who are *not* candidates for coronary artery bypass graft (CABG) surgery or percutaneous transluminal coronary angioplasty (PTCA) surgery who meet **ALL** of the following criteria:

- Presence of class III or IV angina refractory to medical management;
- Documentation of reversible ischemia;
- Left ventricular ejection fraction greater than 30%;

- No evidence of recent myocardial infarction (MI) or unstable angina within the last 21 days; **AND**
- No severe comorbid illness such as chronic obstructive pulmonary disease (COPD).

Transmyocardial laser revascularization **meets the definition of medical necessity** as an adjunct to coronary artery bypass graft (CABG) in those members with documented areas of ischemic myocardium that are amenable to surgical revascularization.

Transmyocardial laser revascularization is considered **experimental or investigational** for all other indications not meeting the above criteria. The evidence is insufficient to determine the effects of the technology on health outcomes.

Percutaneous transmyocardial laser revascularization is considered **experimental or investigational** for all indications. The evidence is insufficient to determine the effects of the technology on health outcomes.

BILLING/CODING INFORMATION:

CPT Coding

33140	Transmyocardial laser revascularization, by thoracotomy; (separate procedure)
33141	Transmyocardial laser revascularization, by thoracotomy; performed at the time of other open cardiac procedure(s) (List separately in addition to code for primary procedure

ICD-10 Diagnosis Codes That Support Medical Necessity

I20.0 – I20.9	Angina pectoris
I25.110 – I25.119	Atherosclerotic heart disease of native coronary artery with angina pectoris
I25.89	Other forms of chronic ischemic heart disease
I25.9	Chronic ischemic heart disease, unspecified

REIMBURSEMENT INFORMATION:

Refer to sections entitled **POSITION STATEMENT**.

PROGRAM EXCEPTIONS:

Federal Employee Program (FEP): Follow FEP guidelines.

State Account Organization (SAO): Follow SAO guidelines.

Medicare Advantage products:

The following National Coverage Determination (NCD) was reviewed on the last guideline reviewed date: Transmyocardial Revascularization (TMR) (20.6) located at cms.gov.

If this Medical Coverage Guideline contains a step therapy requirement, in compliance with Florida law 627.42393, members or providers may request a step therapy protocol exemption to this requirement if based on medical necessity. The process for requesting a protocol exemption can be found at Coverage Protocol Exemption Request

DEFINITIONS:

Angina pectoris (angina): pain radiating from the heart caused by decreased blood supply to the myocardium.

Atherosclerosis: accumulation of plaque containing cholesterol and lipid material, within the inner walls of arteries.

Class III angina: Canadian Cardiovascular Society (CCS) functional classification for angina: Marked limitation of ordinary activity. Angina when walking one or two blocks on the level, or when climbing one flight of stairs at a normal pace.

Class IV angina: Canadian Cardiovascular Society (CCS) functional classification for angina: Inability to carry on any physical activity without discomfort. Angina may be present at rest.

Coronary artery disease: atherosclerotic blockage of the arteries supplying blood to the myocardium.

Ejection fraction: a clinical cardiac measurement – end-systolic volume-end-systolic volume end diastolic volume = ejection fraction.

Myocardium: the heart muscle.

RELATED GUIDELINES:

None applicable.

OTHER:

None applicable.

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COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 04/25/24.

GUIDELINE UPDATE INFORMATION:

06/15/00	Medical Coverage Guideline developed.
09/15/01	Changes to Covered Services" section.
10/15/03	Review and revision of guideline; consisting of updated references and addition of investigational statement for percutaneous myocardial revascularization.
10/15/05	Review and revision of guideline; consisting of updated references.
10/15/06	Review and revision of guideline consisting of updated references.
07/15/07	Annual review, coverage statement maintained, guideline reformatted, references updated.
10/15/08	Review and revision of guideline consisting of updated references.
07/15/09	Annual review: position statements maintained and references updated.
10/15/10	Revision; related ICD-10 codes added.
06/15/11	Scheduled review; position statements maintained, coding section and references updated.
05/11/14	Revision: Program Exceptions section updated.
10/01/15	Revision; ICD9 & ICD10 coding sections updated.
11/01/15	Revision: ICD-9 Codes deleted.
05/15/17	Revision; Investigational position statement added; description, program exception and references updated.
06/15/18	Revision; Description, coding, and references updated.
05/15/20	Review; Position statements maintained and references updated.
04/15/22	Review: Position statements maintained; references updated.
05/23/23	Update to Program Exceptions section.
05/15/24	Review: Position statements maintained; description and references updated.