Medical Coverage Policy | Enhanced External Counterpulsation (EECP)

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OVERVIEW

This policy documents coverage guidelines for Medicare Advantage Plans and Commercial Products for enhanced external counterpulsation (EECP) used in outpatient treatment. EECP is a noninvasive treatment used to augment diastolic pressure, decrease left ventricular afterload, and increase venous return. It has been studied primarily as a treatment for patients with refractory angina and heart failure.

MEDICAL CRITERIA

Medicare Advantage Plans

Not applicable

Commercial Products

A single* course of enhanced external counterpulsation (EECP) may be considered medically necessary for individuals when the criteria below are met:

1. Disabling, chronic, stable angina, (defined as Class III or Class IV Canadian Cardiovascular Society Classification [see definition section] angina or equivalent); **AND**
2. Individuals refractive to optimal medical therapy and not readily amenable to surgical intervention such as percutaneous transluminal coronary angioplasty (PTCA) or cardiac bypass due to any of the following:
    a. Condition is inoperable; or
    b. High risk of operative complications or postoperative failure; or
    c. Coronary anatomy is not readily amenable to such procedures; **AND**
3. None of the following comorbid conditions or contraindications that would result in excessive risk are present, including but not limited to the following:
    a. Aortic insufficiency (regurgitation might prevent diastolic augmentation); **OR**,
    b. Arrhythmias such as atrial fibrillation, atrial flutter, ventricular tachycardia, and frequent premature ventricular beats (might interfere with the device's triggering mechanism); **OR**
    c. Uncontrolled bleeding diatheses; **OR**
    d. Severe heart failure; **OR**
    e. Deep vein thrombosis, varicosities, or stasis ulcers; **OR**
    f. Peripheral vascular disease, phlebitis (increased risk of thromboembolus); **OR**
    g. Severe hypertension (treatment could produce diastolic blood pressure above acceptable limits); **OR**
    h. Stroke; **AND**
4. Procedure to be performed under direct physician supervision

Note:* A single course of treatment consists of a total of 35 hours of EECP; treatment is administered for one to two hours daily, 5 days a week, for approximately 3½ to 7 weeks.

A repeat course of EECP therapy is considered medically necessary in individuals who met the criteria in the above section, have chronic stable angina and who have objectively demonstrated a response to EECP. This would include those individuals who demonstrate one or more of the following:

1. Early improvement in radionuclide stress perfusion imaging compared to a pre-EECP baseline; **OR**
2. Reduction in antianginal medication use; **OR**
3. Improvement in exercise tolerance.

The use of ECP is considered not medically necessary for all other cardiac indications not otherwise specified.

The use of EECP is considered not medically necessary for all other indications not listed above.

PRIOR AUTHORIZATION

Medicare Advantage Plans
Not applicable

Commercial Products
Prior authorization is recommended for Commercial Products.

POLICY STATEMENT

Medicare Advantage Plans
Enhanced External Counterpulsation (EECP) is covered for Medicare Advantage Plan members.

Note: Blue Cross & Blue Shield of Rhode Island (BCBSRI) must follow Centers for Medicare and Medicaid Services (CMS) guidelines, such as national coverage determinations or local coverage determinations for all Medicare Advantage Plan policies. Therefore, Medicare Advantage Plan policies may differ from Commercial products. In some instances, benefits for Medicare Advantage Plans may be greater than what is allowed by the CMS.

Commercial Products
The use of EECP may be considered medically necessary when the above medical criteria has been met.

The use of EECP is considered not medically necessary when the criteria above are not met and for all other indications.

COVERAGE

Benefits may vary between groups/contracts. Please refer to the appropriate section of the Benefit Booklet, Evidence of Coverage or Subscriber Agreement for services not medically necessary.

BACKGROUND

Enhanced external counterpulsation (EECP) uses timed, sequential inflation of pressure cuffs on the calves, thighs, and buttocks to augment diastolic pressure, decrease left ventricular afterload, and increase venous return. The proposed mechanism of action is the augmentation of diastolic pressure by displacement of a volume of blood backward into the coronary arteries during diastole when the heart is in a state of relaxation and resistance in the coronary arteries is at a minimum. The resulting increase in coronary artery perfusion pressure may enhance coronary collateral development or increase flow through existing collaterals. Also, when the left ventricular contracts, it faces reduced aortic counterpressure, because the counterpulsation has somewhat emptied the aorta. EECP has been primarily investigated as a treatment for chronic stable angina.

Intra-aortic balloon counterpulsation is a more familiar, invasive form of counterpulsation that is used as a method of temporary circulatory assistance for the ischemic heart, often after acute myocardial infarction. In contrast, EECP is thought to provide a permanent effect on the heart by enhancing the coronary collateral development. A full course of therapy usually consists of 35one-hour treatments, which may be offered once or twice daily, usually 5 days a week. The multiple components of the procedure include the use of the device itself, finger plethysmography to follow the blood flow, continuous electrocardiograms to trigger inflation and deflation, and optional use of pulse oximetry to measure oxygen saturation before and after treatment.

A variety of enhanced external counterpulsation (EECP) devices have been cleared for marketing by the Food and Drug Administration (FDA) through the 510(k) process.

Examples of EECP devices with FDA clearance and the manufacturers are:

- External Counterpulsation System (Vamed Medical Instrument)
- Pure Flow External Counter-Pulsation Device (Xtreem Pulse)

- Renew® NCP-5 External Counterpulsation System (Renew Group)
- ECP Health System Model (ECP Health)
- CardiAssist™Counter Pulsation System (Cardiomedics)
- ACS Model NCP-2 External Counterpulsation Device (Applied Cardiac Systems)
- EECP® Therapy System (Vasomedical)

Medicare has published a national coverage decision on EECP that allows coverage for the following indications:
"Coverage is provided for the use of ECP [external counterpulsation] for patients who have been diagnosed with disabling angina (Class III or Class IV, Canadian Cardiovascular Society Classification or equivalent classification) who, in the opinion of a cardiologist or cardiothoracic surgeon, are not readily amenable to surgical intervention, such as percutaneous transluminal coronary angioplasty or cardiac bypass because:

1) Their condition is inoperable, or at high risk of operative complications or post-operative failure;
2) Their coronary anatomy is not readily amendable to such procedures; or
3) They have co-morbid states which create excessive risk."

Medicare's coverage decision also noted that while the U.S. Food and Drug Administration has cleared EECP "for use in treating a variety of cardiac conditions, including stable or unstable angina pectoris, acute myocardial infarction and cardiogenic shock, the use of this device to treat cardiac conditions other than stable angina pectoris is not covered."

The augmented diastolic pressure and retrograde aortic flow appear to improve myocardial perfusion, while systolic unloading appears to reduce cardiac workload and oxygen requirements. The increased venous return coupled with enhanced systolic flow appears to increase cardiac output. As a result of this treatment, most patients experience increased time until onset of ischemia, increased exercise tolerance, and a reduction in the number and severity of anginal episodes. Evidence was presented that this effect lasted well beyond the immediate post-treatment phase, with patients' symptom-free for several months to two years. This procedure must be done under direct supervision of a physician.

CODING

Medicare Advantage Plans
The following HCPCS code is covered for Medicare Advantage Plans:
G0166 External counterpulsation, per treatment session

Commercial Products
The following HCPCS code may be considered medically necessary for Commercial Products when the above medical criteria is met:
G0166 External counterpulsation, per treatment session

RELATED POLICIES

Not applicable

PUBLISHED

Provider Update, August 2026
Provider Update, May 2025
Provider Update, September 2024
Provider Update, July 2023
Provider Update, September 2022

REFERENCES

1. Center for Medicare & Medicaid Services (CMS). National Coverage Determination for external counterpulsation (ECP) therapy for severe angina (20.20). 2006; https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?ncdid=97&ncdver=2 Accessed May 13, 2026.

2. Arora RR, Chou TM, Jain D, et al. The multicenter study of enhanced external counterpulsation (MUST-EECP): effect of EECP on exercise-induced myocardial ischemia and anginal episodes. J Am Coll Cardiol. Jun 1999; 33(7): 1833-40.PMID 10362181
3. Arora RR, Chou TM, Jain D, et al. Effects of enhanced external counterpulsation on Health-Related Quality of Life continue 12 months after treatment: a substudy of the Multicenter Study of Enhanced External Counterpulsation. JInvestig Med. Jan 2002; 50(1): 25-32. PMID 11813825
4. Bondesson SM, Edvinsson ML, Pettersson T, et al. Reduced peripheral vascular reactivity in refractory angina pectoris: Effect of enhanced external counterpulsation. J Geriatr Cardiol. Dec 2011; 8(4): 215-23. PMID 22783308
5. Gloekler S, Meier P, de Marchi SF, et al. Coronary collateral growth by external counterpulsation: a randomised controlled trial. Heart. Feb 2010; 96(3): 202-7. PMID 19897461
6. Buschmann EE, Utz W, Pagonas N, et al. Improvement of fractional flow reserve and collateral flow by treatment with external counterpulsation (Art.Net.-2 Trial). Eur J Clin Invest. Oct 2009; 39(10): 866-75. PMID 19572918
7. Braith RW, Conti CR, Nichols WW, et al. Enhanced external counterpulsation improves peripheral artery flow-mediated dilation in patients with chronic angina: a randomized sham-controlled study. Circulation. Oct 19 2010; 122(16): 1612-20.PMID 20921442
8. Casey DP, Beck DT, Nichols WW, et al. Effects of enhanced external counterpulsation on arterial stiffness and myocardial oxygen demand in patients with chronic angina pectoris. Am J Cardiol. May 15 2011; 107(10): 1466-72. PMID 21420062
9. Shakouri SK, Razavi Z, Eslamian F, et al. Effect of Enhanced External Counterpulsation and Cardiac Rehabilitation on Quality of Life, Plasma Nitric Oxide, Endothelin 1 and High Sensitive CRP in Patients With Coronary Artery Disease: A Pilot Study. Ann Rehabil Med. Apr 2015; 39(2): 191-8. PMID 25932415
10. Blue Cross and Blue Shield Association Technology Evaluation Center (TEC). External Counterpulsation for Treatment of Chronic Stable Angina Pectoris and Chronic Heart Failure. TEC Assessments. 2005;20;Tab 12.
11. Holubkov R, Kennard ED, Foris JM, et al. Comparison of patients undergoing enhanced external counterpulsation and percutaneous coronary intervention for stable angina pectoris. Am J Cardiol. May 15 2002; 89(10): 1182-6. PMID12008172
12. Shechter M, Matetzky S, Feinberg MS, et al. External counterpulsation therapy improves endothelial function in patients with refractory angina pectoris. J Am Coll Cardiol. Dec 17 2003; 42(12): 2090-5. PMID 14680732
13. Feldman AM, Silver MA, Francis GS, et al. Treating heart failure with enhanced external counterpulsation (EECP): design of the Prospective Evaluation of EECP in Heart Failure (PEECH) trial. J Card Fail. Apr 2005; 11(3): 240-5. PMID15812754
14. Feldman AM, Silver MA, Francis GS, et al. Enhanced external counterpulsation improves exercise tolerance in patients with chronic heart failure. J Am Coll Cardiol. Sep 19 2006; 48(6): 1198-205. PMID 16979005
15. Abbottsmith CW, Chung ES, Varricchione T, et al. Enhanced external counterpulsation improves exercise duration and peak oxygen consumption in older patients with heart failure: a subgroup analysis of the PEECH trial. Congest Heart Fail.2006; 12(6): 307-11. PMID 17170583
16. Rampengan SH, Prihartono J, Siagian M, et al. The Effect of Enhanced External Counterpulsation Therapy and Improvement of Functional Capacity in Chronic Heart Failure patients: a Randomized Clinical Trial. Acta Med Indones. Oct2015; 47(4): 275-82. PMID 26932695
17. Belenkov YN, Lishuta AS, Slepova OA, et al. The EXCEL Study: Long-term Observation of the Effectiveness of Drug and Non-drug Rehabilitation in Patients with Ischemic Heart Failure. Kardiologiia. Jan 31 2024; 64(1): 14-24. PMID 38323440
18. Soran O, Kennard ED, Kelsey SF, et al. Enhanced external counterpulsation as treatment for chronic angina in patients with left ventricular dysfunction: a report from the International EECP Patient Registry (IEPR). Congest Heart Fail. 2002; 8(6): 297-302. PMID 12461318
19. Lawson WE, Kennard ED, Holubkov R, et al. Benefit and safety of enhanced external counterpulsation in treating coronary artery disease patients with a history of congestive heart failure. Cardiology. 2001; 96(2): 78-84. PMID 11740136

20. Lawson WE, Silver MA, Hui JC, et al. Angina patients with diastolic versus systolic heart failure demonstrate comparable immediate and one-year benefit from enhanced external counterpulsation. J Card Fail. Feb 2005; 11(1): 61-6. PMID15704066
21. Vijayaraghavan K, Santora L, Kahn J, et al. New graduated pressure regimen for external counterpulsation reduces mortality and improves outcomes in congestive heart failure: a report from the Cardiomedics External Counterpulsation Patient Registry. Congest Heart Fail. 2005; 11(3): 147-52. PMID 15947536
22. Soran O, Fleishman B, Demarco T, et al. Enhanced external counterpulsation in patients with heart failure: a multicenter feasibility study. Congest Heart Fail. 2002; 8(4): 204-8, 227. PMID 12147943
23. McKenna C, McDaid C, Suekarran S, et al. Enhanced external counterpulsation for the treatment of stable angina and heart failure: a systematic review and economic analysis. Health Technol Assess. Apr 2009; 13(24): iii-iv, ix-xi, 1-90. PMID19409154
24. Lin JC, Song S, Ng SM, et al. Interventions for acute non-arteritic central retinal artery occlusion. Cochrane Database Syst Rev. Jan 30 2023; 1(1): CD001989. PMID 36715340
25. Werner D, Michalk F, Harazny J, et al. Accelerated reperfusion of poorly perfused retinal areas in central retinal artery occlusion and branch retinal artery occlusion after a short treatment with enhanced external counterpulsation. Retina. Aug 2004; 24(4): 541-7. PMID 15300074
26. Lawson WE, Hui JC, Kennard ED, et al. Effect of enhanced external counterpulsation on medically refractory angina patients with erectile dysfunction. Int J Clin Pract. May 2007; 61(5): 757-62. PMID 17493089
27. Han JH, Leung TW, Lam WW, et al. Preliminary findings of external counterpulsation for ischemic stroke patient with large artery occlusive disease. Stroke. Apr 2008; 39(4): 1340-3. PMID 18309160
28. Lin S, Liu M, Wu B, et al. External counterpulsation for acute ischaemic stroke. Cochrane Database Syst Rev. Jan 18 2012; 1: CD009264. PMID 22259001
29. Sardina PD, Martin JS, Avery JC, et al. Enhanced external counterpulsation (EECP) improves biomarkers of glycemic control in patients with non-insulin-dependent type II diabetes mellitus for up to 3 months following treatment. Acta Diabetol. Oct 2016; 53(5): 745-52. PMID 27179825
30. Sardina PD, Martin JS, Dzieza WK, et al. Enhanced external counterpulsation (EECP) decreases advanced glycation end products and proinflammatory cytokines in patients with non-insulin-dependent type II diabetes mellitus for up to 6 months following treatment. Acta Diabetol. Oct 2016; 53(5): 753-60. PMID 27278477
31. Nagendra L, Dutta D, Sharma M, et al. Impact of Enhanced External Counter-pulsation Therapy on Glycaemic Control in People With Prediabetes and Type 2 Diabetes Mellitus: A Systematic Review and Meta-analysis. Touch REV Endocrinol. Nov 2023; 19(2): 9-15. PMID 38187074
32. Fihn SD, Gardin JM, Abrams J, et al. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS Guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, and the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol. Dec 18 2012; 60(24): e44-e164. PMID 23182125
33. Fihn SD, Blankenship JC, Alexander KP, et al. 2014 ACC/AHA/AATS/PCNA/SCAI/STS focused update of the guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines, and the American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol. Nov 04 2014; 64(18): 1929-49. PMID 25077860
34. Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. J Am Coll Cardiol. May 03 2022; 79(17): e263-e421. PMID 35379503

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