EECP/ECP BIBLIOGRAPHY

BOOKS AND BOOK CHAPTERS

Enhanced External Counterpulsation Waveform Interpretation and Clinical Application; A Primer and Case-Based Troubleshooting Guide
Sanjay Mittal, S. Ramasamy
Chapter 98, Role of Enhanced External Counterpulsation: Future Perspectives
S. Ramasamy, MD
Self-published India 2020

Cardiodynamics Update: A Textbook of Cardiology
Ed: HK Chopra, Shashank R Joshi, GS Wander, Ravi R Kasliwal, Viveka Kumar, AK Pancholia
Chapter 98, Role of Enhanced External Counterpulsation: Future Perspectives
Sanjay Mittal, S. Ramasamy

Coronary Artery Disease: New Approaches without Traditional Revascularization
Ed: GW Barsness MD and DR Holmes Jr. MD
Chapter 6, EECP, 53-66
London, Springer 2012

Scientific Basis of Healthcare: Angina
Ed: CR Martin, MD and VR Preedy, MD
Chapter 10, Enhanced External Counterpulsation Therapy in Coronary Artery Disease Management, 174-198
Ozlem Soran and Debra L Braverman. Enfield, USA: Science Publishers 2011

Angina Pectoris
Ed: Federico Piscione
Chapter 6, The Role of Enhanced External Counterpulsation Therapy in Management of Coronary Artery Disease, 137-158
Ozlem Soran. Rijeka, Croatia: InTech, October 2011

External Counterpulsation: A Novel Therapy to Stimulate Arteriogenesis
Nikolaos Pagonas, MD
Südwestdeutscher Verlag für Hochschulschriften AG Co. KG, 2011

Heart Failure: Device Management
Ed. Arthur Feldman, MD, PhD
Chapter 13. The Role of Enhanced External Counterpulsation in Heart Failure Management, 151-164
West Sussex, UK: Blackwell Publishing 2010

Enhanced External Counter-pulsation
Jami Shakibi, MD, FACC
Self-Published, Tehran, Iran 2008

Heal Your Heart with EECP: The Only Noninvasive Way to Overcome Heart Disease
Debra Braverman, MD
Berkley, California: Celestial Arts, 2005.

Passing on Bypass
Chapter 8-10
George Juetersonke, DO Pikes Peak Press, 2001
JOURNAL ARTICLES

External Counterpulsation Enhances Endothelial Metabolism and Neurogenic Activity in Ischemic Stroke: New Evidence by Analyzing Transcranial ...
L Xiong, D Liu, Y Wang, KSL Wong, Y Fan - Stroke, 51:AWP186 2020
https://www.ahajournals.org/doi/abs/10.1161/str.51.suppl_1.WP186


Evaluation of the role of enhanced external counter pulsation in patients with chronic heart failure Sabapathy Kannappan and Thirumal Babu Kannappan: International Journal of Advances in Medicine pISSN 2349-3925 | eISSN 2349-3933


Enhanced external counterpulsation improves cardiac function in Beagles after cardiopulmonary resuscitation J Xiong, W Zhang, H Wei, X Li, G Dai, C Hu - Brazilian Journal of Medical and ..., 2020 http://www.scielo.br/scielo.php?pid=S0100-879X2020000100609&script=sci_arttext

External Counterpulsation Enhances Endothelial Metabolism and Neurogenic Activity in Ischemic Stroke: New Evidence by Analyzing Transcranial ... L Xiong, D Liu, Y Wang, KSL Wong, Y Fan - Stroke, 2020
https://www.ahajournals.org/doi/abs/10.1161/str.51.suppl_1.WP186


External Counterpulsation Increases Beat-to-Beat Heart Rate Variability in Patients with Ischemic Stroke. Li Xiong, Ge Tian, Li Wang, Wenhua Lin, Xiangyan Chen, Thomas Wai Hong Leung, Yannie Oi Yan Soo, Lawrence Ka Sing Wong, Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Hong Kong, China - Journal of Stroke & Cardiovascular Diseases April 2017 Vol 26 Iss 4 doi: http://dx.doi.org/10.1016/j.jstrokecerebrovasdis.2017.03.007


Adaptation of external counterpulsation based on individual shear rate therapy improves endothelial function and claudication distance in peripheral artery disease. EE Buschmann, M Brix, L Li, J Doreen, A Zietzer, M Li... - VASA. Zeitschrift für... 2016

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. Sardina PD, Martin JS, Dzieza WK, Braith RW. Acta Diabetol. 2016 Jun 9.

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. Sardina PD, Martin JS, Avery JC, Braith RW. Acta Diabetol. 2016 May 14


Impact of Enhanced External Counterpulsation on Heart Failure Rehospitalization in Patients With Ischemic Cardiomyopathy Kristen M. Tecson, PhD, Marc A. Silver, MD, Sonja D. Brune, CNS, Clay Cauthen, MD, Michael D. Kwan, MD, Jeffrey M. Schussler, MD, Anupama Vasudevan, PhD, James A. Watts, MD, Peter A. McCullough, MD, MPH DOI: http://dx.doi.org/10.1016/j.amjcard.2015.12.024


Enhanced External Counterpulsation Is an Effective Treatment for Depression in Patients With Refractory Angina Pectoris. Prim Care Companion CNS Disord. 2015 Aug 20;17(4).May O, Søgaard HJ.


The enhanced external counterpulsation as a method of non-invasive auxiliary blood circulation used for the combined rehabilitative treatment of the patients surviving after ischemic stroke (a review). Eneeva MA, Kostenko EV, Razumov AN, Petrova LV, Bobyreva SN, Nesuk OM. Vopr Kurortol Fizioter Lech Fiz Kult. 2015 May-Jun;92(3):45-52


Enhanced external counterpulsation reduces indices of central blood pressure and myocardial oxygen demand in patients with left ventricular dysfunction.
Darren T Beck, Darren P Casey, Jeffrey S Martin, Paloma D Sardina, Randy W Braith

Enhanced external counterpulsation - effect on angina pectoris, QoL and exercise capacity after 1 year.

The combined application of enhanced external counterpulsation for the rehabilitation of the patients presenting with coronary heart disease.
Vopr Kurortol Fizioter Lech Fiz Kult
T A Kniazeva, M V Nikitin, M P Otto, N V Trukhacheva, I V Cherkashina

Enhanced external counterpulsation - Effect on angina pectoris, QoL and exercise capacity after 1 year.
Scand. Cardiovasc. J.
Ole May, Vibeke Lynggaard, Jesper C A Mortensen, Jerzy Malczynski

Effect of enhanced extracorporeal counterpulsation in patients with non-arteritic anterior ischaemic optic neuropathy.
Wenhui Zhu, Ruiduan Liao, Yongchong Chen, Li Liu, Yan Zhang

Enhanced external counterpulsation improves endothelial function and exercise capacity in patients with ischaemic left ventricular dysfunction.
Clin Exp Pharmacol Physiol 2014 Sep;41(9):628-36
Darren T Beck, Jeffrey S Martin, Darren P Casey, Joseph C Avery, Paloma D Sardina, Randy W Braith

Alternative therapy for medically refractory angina: enhanced external counterpulsation and transmyocardial laser revascularization.
Ozlem Soran
The immediate and one-year outcomes of dialysis patients with refractory angina treated by enhanced external counterpulsation.
Chung-Kuan Wu, Huel-Fong Hung, Jyh-Gang Leu, Der-Cherng Tarng, Ming-Hsien Tsai, Shou-Shan Chiang

Peripheral resistance artery blood flow in subjects with abnormal glucose tolerance is improved following enhanced external counterpulsation therapy.
Jeffrey S Martin, Darren T Beck, Randy W Braith

Enhanced external counterpulsation inhibits endothelial apoptosis via modulation of BIRC2 and Apaf-1 genes in porcine hypercholesterolemia.
Yan Xiong, Yu-Feng Ren, Jia Xu, Da-Ya Yang, Xiao-Hong He, Jing-Yun Luo, Jamal S Rana, Yan Zhang, Zhen-Sheng Zheng, Dong-Hong Liu, Gui-Fu Wu

Relation between N-terminal pro-brain natriuretic peptide levels and response to enhanced external counterpulsation in chronic angina pectoris.
Anders Sahlin, Eline Wu, Andreas Ruck, Inger Hagerman, Gunilla Forstedt, Christer Sylvén, Margareta Berglund, Tomas Jernberg

Effect of Enhanced External Counterpulsation (EECP) on Exercise Time Duration and Functional Capacity in Patients with Refractory Angina Pectoris.
Ali Bozorgi, Entezar Mehrabi Nasab, Akram Sardari, Mostafa Nejatian, Shaghayegh Nasirpour, Sakineh Sadeghi

Increasing pressure of external counterpulsation augments blood pressure but not cerebral blood flow velocity in ischemic stroke.
Wenhua Lin, Li Xiong, Jinghao Han, Howan Leung, Thomas Leung, Yannie Soo, Xiayyan Chen, Ka Sing Lawrence Wong.

Hemodynamic effect of external counterpulsation is a different measure of impaired cerebral autoregulation from vasoreactivity to breath-holding.
W. Lin, L. Xiong, J. Han, T. Leung, H. Leung, X. Chen, K. S. L. Wong.

Enhanced External Counterpulsation inhibits endothelial apoptosis via modulation of BIRC2 and Apaf-1 genes in porcine hypercholesterolemia.
Yan Xiong, Yu-feng Ren, Jia Xu, Da-ya Yang, Xiao-hong He, Jing-yun Luo, Jamal S. Rana, Yan Zhang, Zhen-sheng Zheng, Dong-hong Liu, Gui-fu Wu

Relation between N-terminal pro-brain natriuretic peptide levels and response to enhanced external counterpulsation in chronic angina pectoris.
Coron Artery Dis. 2013 Nov 8.

Effect of enhanced external counterpulsation treatment on renal function in cardiac patients.
Prajey Ruangkanchanasetr, Nithi Mahanonda, Ongkarn Raungratanaamporn, Piyanuj Ruckpanich Chagriya Kitiyakara, Amnart Chaiprasert, Surawat Adirekkiat, Dapolap Punpanich, Somlak Vanavananan, Anchalee Chittam, Thanom Supaporn
Longer treatment duration is associated with better functional outcome in counterpulsation-treated recent ischemic stroke patients.
Wen Hua Lin, Jinghao Han, Xiang-Yan Chen, Li Xiong, Ho wan Leung, W.H. Leung, Yannie Soo, Lawrence Wong.
BMJ Open, 2013 (to be published).

**Enhanced External Counterpulsation Improves Peripheral Resistance Artery Blood Flow in Patients With Coronary Artery Disease.**

The effectiveness of enhanced external counterpulsation (EECP) in patients suffering from chronic refractory angina previously treated with transmyocardial laser revascularisation.

**Enhanced external counterpulsation improves cerebral blood flow following cardiopulmonary resuscitation.**
Rong Liu, Zi-Jing Liang, Xiao-Xing Liao, Chun-Lin Hu, Li Jiang, Gang Dai, Ying-Qing Li, Hong-Yan Wei, Gui-Fu Wu, Xin Li

**Effect of enhanced external counterpulsation therapy on myeloperoxidase in lowering cardiovascular events of patients with chronic heart failure.**

**Effect of enhanced external counterpulsation depends on arterial compliance**
Ashkan Eftekari, Ole May

**The Safety and Efficacy of Enhanced External Counterpulsation as a Treatment for Angina in Patients with Aortic Stenosis.**
Debra L Braverman, Len Braitman, Vincent M Fifeuredo.


**Efficacy of Enhanced External Counterpulsation (EECP) in Nepalese chronic stable Angina patient: a single centre prospective study at Shahid Gangalal National Heart Center (SGNHC).**
Adhikari CM, Prajapati D, Thapa S, KC MB.

**Improvement of angina, quality of life, and working capacity after enhanced external counterpulsation.**

**Predictors of good functional outcome in counterpulsation-treated recent ischaemic stroke patients.**
Wenhua Lin, Jinghao Han, Xiangyan Chen, Li Xiong, Ho Wan Leung, Thomas W Leung, Yannie Soo, Lawrence Ka Sing Wong.

**Enhanced external counterpulsation improves cerebral blood flow following cardiopulmonary resuscitation.**
Rong Liu, Zi-Jing Liang, Xiao-Xing Liao, Chun-Lin Hu, Li Jiang, Gang Dai, Ying-Qing Li, Hong-Yan Wei, Gui-Fu Wu, Xin Li
Effect of enhanced external counterpulsation therapy on myeloperoxidase in lowering cardiovascular events of patients with chronic heart failure.

Effect of enhanced external counterpulsation depends on arterial compliance
Ashkan Eftekari, Ole May

The Safety and Efficacy of Enhanced External Counterpulsation as a Treatment for Angina in Patients with Aortic Stenosis.

Clinical study in patients with ocular ischemic diseases treated with enhanced external counterpulsation combined with drugs.
Yang Y, Zhang H, Yan Y, Gui Y.

Efficacy of Enhanced External Counterpulsation (EECP) in Nepalese chronic stable Angina patient: a single centre prospective study at Shahid Gangalal National Heart Center (SGNHC).
Adhikari CM, Prajapati D, Thapa S, KC MB.

Improvement of angina, quality of life, and working capacity after enhanced external counterpulsation.
Jørgensen MT, May O.

Predictors of good functional outcome in counterpulsation-treated recent ischaemic stroke patients.
Wenhua Lin, Jinghao Han, Xiangyan Chen, Li Xiong, Ho Wan Leung, Thomas W Leung, Yannie Soo, Lawrence Ka Sing Wong.

Early Enhanced External Counter Pulsation Improves Neurological Recovery After the Return of Spontaneous Circulation in a Mongrel Dog Cardiac Arrest Model.
Hu, Chun-Lin, Liu, Rong, Liao, Xiao-Xing, Wei, Hong-Yan, Li, Xin, Zhan, Hong, Jing, Xiao-Li, Xiong, Yan, Huang, Guo-Qing, Wu, Gui-Fu. Critical Care Medicine: June 2013 - Volume 41 - Issue 6 - p e62–e73. doi: 10.1097/CCM.0b013e318278b469

Enhanced external counterpulsation: A novel therapy for angina
Debra L Braverman
Complementary Therapies in Clinical Practice 2012;1-7

Treatment with enhanced external counterpulsation improves cognitive functions in chronic heart failure patients.
Gülgiz Ko zdag, Pervin I seri, Gokcen Gokce, Gokhan Ertas, Fatih Ayg un, Ayse Kutlu, Kathy Hebert, Dilek Ural.

Are peripheral arterial changes during enhanced external counterpulsation necessary for and/or evidence of an adequate cardiovascular response?
Daniel Bla and Yanina Zo’elo.

The collateral circulation of the heart
Pascal Meier, Stephan H Schirmer, Alexandra J Lansky, Adam Timmis, Bertram Pitt, Christian Seiler.
Therapeutic effects of Enhanced External Counter Pulsation (EECP) on clinical symptoms, echocardiographic measurements, perfusion scan parameters and exercise tolerance test in coronary artery disease patients with refractory angina.
Eslamian F, Aslanabadi N, Mahmoudian B, Shakouri SK.

Enhanced external counterpulsation in patients with refractory angina pectoris: a pilot study with six months follow-up regarding physical capacity and health-related quality of life.
Wu E, Mårtensson J, Broström A.

Anti-inflammatory effects of enhanced external counterpulsation in subjects with abnormal glucose tolerance.

Enhanced external counterpulsation creates acute blood flow patterns responsible for improved flow-mediated dilation in humans.
Alvaro N Gurovich and Randy W Braith. Hypertension Research advance online publication, 18 October 2012; doi:10.1038/hr.2012.169

Cause or Effect of Arteriogenesis: Compositional Alterations of Microparticles from CAD Patients Undergoing External Counterpulsation Therapy.
Al Kaabi A, Traupe T, Stutz M, Buchs N, Heller M.
PLOS ONE 2012, 7(10): e44822. doi:10.1371/journal.pone.0048622

External Counterpulsation Augments Blood Pressure and Cerebral Flow Velocities in Ischemic Stroke Patients With Cerebral Intracranial Large Artery Occlusive Disease
Wenhua Lin, Li Xiong, Jinghao Han, Thomas Wai Hong Leung, Yannie Oi Yan Soo, Xiangyan Chen, Ka Sing Lawrence Wong. Stroke. 2012;43:00-00

Comparison of long term clinical outcomes, event free survival rates of patients undergoing enhanced external counterpulsation for coronary artery disease in the United States and Turkey

Vasculoprotective properties of enhanced external counterpulsation for coronary artery disease: Beyond the hemodynamics
Yang DY, Wu GF
International Journal of Cardiology; E pub ahead of print, published online 07 May 2012.

Enhanced External Counterpulsation for Ischemic Heart Disease: A Look Behind the Curtain
Randy W. Braith, Darren P. Casey, and Darren T. Beck

Clinical Effects of Enhanced External Counterpulsation Treatment in Patients with Ischemic Heart Failure
Anadolu Kardiylol Derg 2012 Mayis 1; 12(3): Article in Press

The Effect of Enhanced External Counterpulsation on C-reactive protein and flow-mediated dilation in porcine model of hypercholesterolaemia

Enhanced External Counterpulsation Has No Lasting Effect on Ambulatory Blood Pressure
Ole May, Wael Abdulla Mohammed Khair
Clin Cardiol 2012 DOI: 10.1002/cic.22045
The Immediate Hemodynamic Effects of Enhanced External Counterpulsation on the Left Ventricular Function
Eftekhari, A and May, O
Scandinavian Cardiovascular Journal, 2012; 46 (2): 81-86

The therapeutic effects of enhanced external counterpulsation on refractory angina in patients, unsuitable for invasive interventions
Aslan Abadi Naser, Salehi Rezvaneyeh, Alizadeh Azin, Eslamityan Fariba, Ahmadzadeh Pournaky Ahmad, Tsban Sadeghi Mohamad Reza
The J of Urmia University of Medical Sciences 2012;April-May, 23(1):7-14


The Effects of Enhanced External Counterpulsation on Health-related Quality of Life in Patients with Angina Pectoris
Ziaeirad M, Ziaei GR, Sadeghi N, Motaghi M, Torkan B
Iranian Journal of Nursing and Midwifery Research 2012;17(1):1-7

Effect of Enhanced External Counterpulsation Treatment on mean Platelet Volume in Patients Affected by Ischemic Heart Failure
Ertas G, Kozdag G, Emre E, Akay Y, Ural D, Hebert, K

Enhanced External Counterpulsation (EECP) Improves Peripheral Artery Function and Glucose Tolerance in Subjects with Abnormal Glucose Tolerance
Martin JS, Beck DT, Aranda Jr. JM, Braith RW

Effect of enhanced external counterpulsation on C-reactive protein and interleukin-6 in patients with coronary heart disease
WEI Hai-zhu
Hainan, China Hainan Medical J. 2011; 22(3):56-57

Reduced peripheral vascular reactivity in refractory angina pectoris: Effect of Enhanced External Counterpulsation
Susanne M Bondesson, Marie-Louise Edvinsson, Thomas Pettersson, Lars Edvinsson

Microvascular response to metabolic and pressure challenge in the human coronary circulation

Hospital utilization and costs for spinal cord stimulation compared with enhanced external counterpulsation for refractory angina pectoris.
Bondesson, S. M., Jakobsson, U., Edvinsson, L. and Hallberg, I. R.

Enhanced External Counterpulsation improves endothelial function, inflammatory markers and depression
Deepak Hooda, Ravindra Bhardwaj, Wissam Gharib, Bradford E. Warden, Robert Beto, Abnash C. Jain
ACC 60th Scientific Session 2011; J Am Coll Cardiol 57(14): E2011 Title: Best Fellows-In-Training Poster Awards
Effects of Enhanced External Counterpulsation on Arterial Stiffness and Myocardial Oxygen Demand in Patients With Chronic Angina Pectoris
Casey DP, Beck DT, Nichols WW, Conti CR, Choi CY, Khuddus MA, Braith RW

Clinical Response of Enhanced External Counter Pulsation (EECP) Among Bangladeshi Ischemic Heart Disease Patients
Kmhs Sirajul Haque, Javed Iqbal, Mahmudur Rahman Siddiqui, Khondaker Syedus
Salehin University Heart Journal. 2011 January Vol. 7, No. 1, 19-22

The Effects of Enhanced External Counterpulsation on Cardiac Electrophysiologic Properties of Patients with Ischemic Heart Disease and Refractory Angina at Function Class II-III
Fariborz Akbarzadeh, Yaghoub Salekzamani, Amir Shahram Beigzdeh

Enhanced External Counter Pulsation (EECP) for Refractory Angina Pectoris (RAP); Results from a first case series
Waqas Ahmed, Naveed Akhter, Ayesha Masood

Effects on blood pressure in patients with refractory angina pectoris after enhanced external counterpulsation
Bondesson S , Pettersson T, Ohlsson O, Hallberg I, Wackenfors A, Edvinsson L

Enhanced External Counterpulsation - A Review
Sayami LA, Ullah M, Rahman MT, Rahman Z, Roy D, Majumder AAS
Cardiovascular Journal2010;2(2):236-244

Does External Counterpulsation Augment Mean Cerebral Blood Flow in the Healthy Brain? Effects of External Counterpulsation on Middle Cerebral Artery Flow Velocity and Cerebrovascular Regulatory Response in Healthy Subjects
Cerebrovascular Diseases 2010;30:612-617

Enhanced External Counterpulsation Improves Peripheral Artery Flow-Mediated Dilation in Patients with Chronic Angina. A Randomized Sham-Controlled Study.

Effect of Enhanced External Counterpulsation on Circulating CD34+ Progenitor Cell Subsets.
Kiernan TJ, Boilson BA, Tesmer L, Harbuzariu A, Simari RD, Barsness GW.
Int J Cardiol. 2010 Sep 13. [Epub ahead of print]

Acute Hemodynamic Effects of Enhanced External Counterpulsation
Reddy BT, Michaels AD

The Four Stages of Development: A Historical Perspective of External Counterpulsation
Hui JCK, Zheng ZS
Journal of Geriatric Cardiology June 2010 Vol 7, No. 2, 74-78

EECP in the Treatment of Endothelial Dysfunction: Preventing Progression of Cardiovascular Disease
Hui JCK, Lawson WE, Barsness GW
Journal of Geriatric Cardiology June 2010 Vol 7, No. 2, 79-87
Role of External Counterpulsation in the Treatment of Ischemic Stroke
Han JH, Leung WH, Wong KS

Enhanced External Counter Pulsation for Refractory Angina Pectoris; Results from a first case series
Ahmed, W, Akhter N, Masood, A
Journal of Pakistan Medical Association 2010: 60:8; 692-694

Impact of Enhanced External Counterpulsation on Canadian Cardiovascular Society Angina Class in Patients with Chronic Stable Angina: A Meta-analysis
Shah SA, Shapiro RJ, Mehta R, Snyder
JA Pharmacotherapy 2010: 30: 7; 639-645

Enhanced External Counterpulsation (EECP) Therapy: Current Evidence For Clinical Practice And Who Will Benefit?
Prasad GN, Ramasamy S, M.Thomas JM, Nayar PG, Sankar MN, Sivakadaksham N, Cherian KM
Indian Heart J. 2010; 62:296-302

Prinzmetal’s Variant Angina is Effectively Treated with Enhanced External Counterpulsation
Tarpgaard Jorgensen M, Gerdes C, May
O Acta Cardiologica 2010;65(2):265-267

Enhanced External Counterpulsation: Mechanisms of Action and Clinical Applications
Kitsou V, Xanthos T, Roberts R, Karlis G, Padadimitriou
L Acta Cardiologica 2010;65(2):239-247

Enhanced External Counterpulsation Attenuates Atherosclerosis Progression Through Modulation of Proinflammatory Signal Pathway
Arterioscler Thromb Vasc Biol 2010;30;773-780; originally published online Feb 11,2010

Enhanced External Counterpulsation is a regenerative therapy.

Enhanced External Counterpulsation and Traction Therapy Ameliorates Rotational Vertebral Artery Flow Insufficiency Resulting from Cervical Spondylsis

Coronary Collateral Growth by External Counterpulsation: A Randomized Controlled Trial
Heart 2010;96:202-207 [e-Pub November 5, 2009]

Effect of Enhanced External Counterpulsation on Plasma Level of Nitric Oxide and Vascular Endothelial Growth Factor
Pourmoghadas M, Nourmohamamadi H, Tabesh F, Haghjoo S, Tabesh E

The efficacy of external counterpulsation depending on severity of coronary artery lesion.

The Efficacy and Safety of Enhanced External Counterpulsation in Patients with Peripheral Arterial Disease.
Improvement of Fractional Flow Reserve and Collateral Flow by Treatment with External Counterpulsation (Art.Net.-2 Trial)

Assessment of the Effect of External Counterpulsation on Myocardial Adaptive Arteriogenesis by Invasive Functional Measurements - Design of the Arteriogenesis Network Trial 2

Enhanced External Counterpulsation Promotes Growth Cytokines-mediated Myocardial Angiogenesis in a Porcine Model of Hypercholesterolemia

Enhanced External Counterpulsation for the Treatment of Stable Angina and Heart Failure: A Systematic Review and Economic Analysis

Effect of Enhanced External Counterpulsation on Clinical Symptoms, Quality of Life, 6-Minute Walking Distance, and Echocardiographic Measurements of Left Ventricular Systolic and Diastolic Function After 35 Days of Treatment and at 1-Year Follow Up in 47 Patients With Chronic Refractory Angina Pectoris

Enhanced External Counterpulsation: An Innovative Physical Therapy for Refractory Angina Braverman DL.

EECP: A Non-invasive Therapy for Refractory Angina
Beaini Y, Morley C.
Practitioner. 2009 Feb;253(1715):27-31

Invasive Left Ventricular Energetics During Enhanced External Counterpulsation
Michaels AD, Tacy T, Teitel D, Shapiro M, Grossman W.

Treatment Options for Refractory Angina Pectoris: Enhanced External Counterpulsation Therapy Soran O.
Current Treatment Options Cardiovascular Medicine. 2009 Feb;11(1):54-60.

Evaluation of Left Ventricular Systolic and Diastolic Regional Function After Enhanced External Counter Pulsation Therapy Using Strain Rate Imaging

Enhanced External Counterpulsation in Treatment of Refractory Angina Pectoris: Two Year Outcome and Baseline Factors Associated with Treatment Failure
Erdling A, Bondesson S, Petterson T, Edvinsson L.

Enhanced External Counterpulsation Improves Systolic Blood Pressure in Patients with Refractory Angina
Campbell AR, Satran D, Zenovich AG, Campbell KM, Espel JC, Arndt TL, Poulouse AK, Boisjolie CR, Juusola K, Bart BA, Henry TD.

Comparison of Patients Undergoing Enhanced External Counterpulsation and Spinal Cord Stimulation for Refractory Angina Pectoris

Passive Tobacco Exposure May Impair Symptomatic Improvement in Patients with Chronic Angina Undergoing Enhanced External Counterpulsation
Efstratiadis S, Kennard ED, Kelsey SF, Michaels AD; International EECP Patient Registry-2 Investigators.
*BMC Cardiovascular Disorders.* 2008 Sep;8(23).

Long-term Effect of Enhanced External Counterpulsation on Endothelial Function in the Patients with Intractable Angina
Hashemi M, Hoseinbalam M, Khazaei M.
*Heart Lung Circulation.* 2008 Aug 13. [Epub ahead of print]

Is Counterpulsation a Potential Therapy for Ischemic Stroke?
Han JH, Wong KS.
*Cerebrovascular Disease.* 2008;26:97-105 epub June 17, 2008

Enhanced External Counterpulsation in the Treatment of Chronic Refractory Angina: A Long-term Follow-up Outcome from the International Enhanced External Counterpulsation Patient Registry
Loh PH, Cleland JG, Louis AA, Kennard ED, Cook JF, Caplin JL, Barsness GW, Lawson WE, Soran OZ, Michaels AD.
*Clinical Cardiology.* 2008 Apr 10;31(4):159-164.

Preliminary Findings of External Counterpulsation for Ischemic Stroke with Large Artery Occlusive Disease
Han JH, Leung TW, Lam WW, Soo YO, Alexandrov AW, Mok V, Leung YV, Lo R, Wong KS.

The Semantic Extension and Storage of EECP Hemodynamic Waveforms Based on DICOM Standard
Xie S, Yu D, Wei X, Wang K.

Effect of Enhanced External Counterpulsation on Inflammatory Cytokines and Adhesion Molecules in Patients with Angina Pectoris and Angiographic Coronary Artery Disease
Casey DP, Conti CR, Nichols WW, Choi CY, Khuddus MA, Braith RW.

Effects of Enhanced External Counterpulsation (EECP) on Myocardial Perfusion
Arora RR, Bergmann S.

Echocardiographic Characteristics Including Tissue Doppler Imaging After Enhanced External Counterpulsation Therapy
Enhanced External Counterpulsation and Future Directions: Step Beyond Medical Management for Patients with Angina and Heart Failure
Manchanda A, Soran O.

An Analysis of the Efficacy and Safety of Enhanced External Counterpulsation at West Virginia University Hospitals
Sajja V, Dod H, Beto R, Jain AC, Hobbs GR, Finkel MS.
The West Virginia Medical Journal. 2007 May-Jun;103(3):10-12

Impact of external counterpulsation treatment on emergency department visits and hospitalizations in refractory angina patients with left ventricular dysfunction. Soran O, Kennard ED, Bart BA, Kelsey SF; IEPR Investigators Congest Heart Fail. 2007 Jan-Feb;13(1):36-40. Erratum in: Congest Heart Fail. 2007 Mar-Apr;13(2):124

Residual High-Grade Angina After Enhanced External Counterpulsation Therapy
McCullough PA, Henry TD, Kennard ED, Kelsey SF, Michaels AD; IEPR Investigators.

Effects of Enhanced External Counterpulsation on Carotid Circulation in Patients with Coronary Artery Disease

The Role of Enhanced External Counterpulsation in the Treatment of Angina and Heart Failure
Arora R.

Enhanced External Counterpulsation Inhibits Intimal Hyperplasia by Modifying Shear Stress Responsive Gene Expression in Hypercholesterolemic Pigs

Enhanced External Counterpulsation In Patients With Coronary Artery Disease-Associated Erectile Dysfunction. Part II: Impact Of Disease Duration And Treatment Courses
El-Sakka AI, Morsy AM, Faghi BI.

Effects of Enhanced External Counterpulsation on Anginal Symptoms and Improvements in Objective Measures of Myocardial Ischaemia
Yavarí M, Montazeri HR.

The Effects of Enhanced External Counterpulsation on Time- and Frequency-Domain Measures of Heart Rate Variability
Michaels AD, Bart BA, Pinto T, Lafferty J, Fung G, Kennard ED.

Impact of Enhanced External Counterpulsation on Peripheral Circulation

Effect of Enhanced External Counterpulsation on Medically Refractory Angina Patients with Erectile Dysfunction
Lawson WE, Hui JC, Kennard ED, Soran O, McCullough PA, Kelsey SF; for the IEPR Investigators.

Portable Enhanced External Counterpulsation for Acute Coronary Syndrome and Cardiogenic Shock: A Pilot Study
Enhanced External Counterpulsation in Patients with Coronary Artery Disease-Associated Erectile Dysfunction. Part I: Effects of Risk Factors

Impact of External Counterpulsation Treatment on Emergency Department Visits and Hospitalizations in Refractory Angina Patients with Left Ventricular Dysfunction
Soran O, Kennard ED, Bart BA, Kelsey SF. Congestive Heart Failure. 2007 Jan-Feb;13(1):36-40

Enhanced External Counterpulsation Improves Exercise Duration and Peak Oxygen Consumption in Older Patients With Heart Failure: A Subgroup Analysis of the PEECH Trial

Effectiveness of Repeat Enhanced External Counterpulsation for Refractory Angina in Patients Failing to Complete an Initial Course of Therapy

Primer: Practical Approach to the Selection of Patients for and Application of EECP

Enhanced External Counterpulsation for the Treatment of Angina Pectoris

Effects of Enhanced External Counterpulsation on Carotid Circulation in Patients with Coronary Artery Disease

Enhanced External Counterpulsation Improves Exercise Tolerance in Patients With Chronic Heart Failure

Enhanced External Counterpulsation Treatment Improves Arterial Wall Properties and Wave Reflection Characteristics in Patients With Refractory Angina

Effect of Enhanced External Counterpulsation on Resting Oxygen Uptake in Patients Having Previous Coronary Revascularization and in Healthy Volunteers

Cyclic GMP Release by Acute Enhanced External Counterpulsation

Effect of External Counterpulsation on Plasma Nitric Oxide and Endothelin-1 Levels
One Year Follow-up of Patients with Refractory Angina Pectoris Treated with Enhanced External Counterpulsation

Enhanced External Counterpulsation Reduces Lung/Heart Ratio at Stress in Patients with Coronary Artery Disease
Lee CM, Wu YW, Jui HY, Chen MF, Lee YT, Soran O.
Cardiology. 2006 May 9;106(4):237-240 [Epub ahead of print]

Enhanced External Counterpulsation for Treatment of Refractory Angina Pectoris

Mechanisms and Evidence for the Role of Enhanced External Counterpulsation in Heart Failure Management
Silver MA.
Current Heart Failure Reports. 2006 Apr;3(1):25-32.

EECP and Coronary Artery Disease

The Immediate and Long-term Outcome of Enhanced External Counterpulsation in Treatment of Chronic Stable Refractory Angina
Loh PH, Louis AA, Wundram J, Rigby AS, Cook J, Hurren S, Nikolay NP, Caplin J, Cleland JG.

Two-Year Outcomes in Patients with Mild Refractory Angina Treated with Enhanced External Counterpulsation

Two year clinical outcomes, event free survival rates and incidence of repeat enhanced external counterpulsation (EECP) in refractory angina patients with left ventricular dysfunction. A report from the international EECP patient registry. Soran O, Kennard ED, Kelsey SF Am J Cardiol. 2006 Jan 1;97(1):17-20.

Impact of Body Mass Index on Outcomes of Enhanced External Counterpulsation Therapy

Angiogenic Effects of Long-term Enhanced External Counterpulsation in a Dog Model of Myocardial Infarction

The Effects of Enhanced External Counterpulsation on Myocardial Perfusion in Patients with Stable Angina: A Multicenter Radionuclide Study

Enhanced External Counterpulsation Improves Endothelium-Dependent Vasorelaxation in the Carotid Arteries of Hypercholesterolemic Pigs

Effects of Enhanced Counterpulsation on Vascular Cell Release of Coagulation Factors
Arora R, Chen HJ, Rabbani L.
Current Nonpharmacologic Management of Coronary Artery Disease: Focus on External Counterpulsation
Conti CR. 

Predictors of Benefit in Angina Patients One Year After Completing Enhanced External Counterpulsation: Initial Responders to Treatment Versus Nonresponders
Lawson WE, Hui JCK, Kennard ED, Barsness G, Kelsey SF. Cardiology. 2005 Apr 13;103(4):201-206

Treating Heart Failure With Enhanced External Counterpulsation (EECP): Design of the Prospective Evaluation of EECP in Heart Failure (PEECH) Trial

Enhanced External Counterpulsation Improves Systolic Function by Echocardiography in Patients with Coronary Artery Disease

Enhanced External Counterpulsion (EECP) as a Novel Treatment for Restless Legs Syndrome (RLS): A Preliminary Test of the Vascular Neurologic Hypothesis for RLS

An Update on Enhanced External Counterpulsation
Shea ML, Conti CR, Arora RR

Enhanced External Counterpulsation: A New Technique to Augment Renal Function in Liver Cirrhosis

Angina Patients with Diastolic Versus Systolic Heart Failure Demonstrate Comparable Immediate and One-Year Benefit from Enhanced External Counterpulsation

Frequency and Efficacy of Repeat Enhanced External Counterpulsation for Stable Angina Pectoris (from the International EECP Patient Registry)

Enhanced External Counterpulsation Does Not Compromise Cerebral Autoregulation

Enhanced External Counterpulsation Does Not Alter Arterial Stiffness in Patients with Angina

Effects of Enhanced External Counterpulsation on Hemodynamics and its Mechanism-Relation to Neurohormonal Factors

Enhanced External Counterpulsation
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
Werner D, Michalk F, Harazny J, Hugo C, Daniel WG, Michelson G.

Effectiveness of Enhanced External Counterpulsation in Patients with Left Main Disease and Angina

Enhanced External Counterpulsation Therapy: Significant Clinical Improvement without Electrophysiologic Remodeling
Henrickson CA, Chandra-Strobos N.

Enhanced External Counterpulsation Improves Skin Oxygenation and Perfusion
Hilz MJ, Werner D, Marthol H, Flachskampf FA, Daniel WG.

Successful Treatment of Symptomatic Coronary Endothelial Dysfunction with Enhanced External Counterpulsation
Bonetti PO, Gadasalli SN, Lerman A, Barsness GW.

Enhanced External Counterpulsation in Ischemic Heart Disease and Congestive Heart Failure
Mielniczuk L, da Silva LB, Haddad H.

Improvement of Oxygen Metabolism in Ischemic Myocardium as a Result of Enhanced External Counterpulsation with Heparin Pretreatment for Patients with Stable
Masuda D, Fujita M, Nohara R, Matsumori A, Sasayama S.

Effect of Enhanced External Counterpulsation on Dobutamine-induced Left Ventricular Wall Motion Abnormalities in Severe Chronic Angina Pectoris
Bagger JP, Hall RJ, Koutroulis G, Nihoyannopoulos P.

Two-Year Outcomes After Enhanced External Counterpulsation for Stable Angina Pectoris (from the International Patient Registry [IEPR])
Michaels AD, Linnemeier G, Soran O, Kelsey SF, Kennard ED.

A New Treatment Modality in Heart Failure Enhanced External Counterpulsation (EECP)
Soran O.

Enhanced External Counterpulsation as Initial Revascularization Treatment for Angina Refractory to Medical Therapy
Fitzgerald CP, Lawson WE, Hui JC, Kennard ED; IEPR Investigators. Cardiology. 2003 Nov;100(3):129-135

Functional Status Improvement After Enhanced External Counterpulsation (EECP) for Treatment of Chronic Angina Pectoris
Kennard ED, Linnemeier G, Kelsey SF.
Enhanced External Counterpulsation for the Relief of Angina in Patients with Diabetes: Safety, Efficacy and 1-Year Clinical Outcomes

Analysis of Baseline Factors Associated with Reduction in Chest Pain in Patients with Angina Pectoris Treated by Enhanced External Counterpulsation

Enhanced External Counterpulsation for Refractory Angina Pectoris

Enhanced External Counterpulsation for Ischemic Heart Disease: What's Behind the Curtain?

Exercise Capability and Myocardial Perfusion in Chronic Angina Patients Treated with Enhanced External Counterpulsation

Changes of Cerebral Blood Flow Velocities During Enhanced External Counterpulsation

Enhanced External Counterpulsation Improves Endothelial Function in Patients with Symptomatic Coronary Artery Disease

Enhanced External Counterpulsation in the Management of Angina in the Elderly

Enhanced External Counterpulsation


A Historical Overview of Enhanced External Counterpulsation
DeMaria AN. *Clinical Cardiology.* 2002 Dec;25(12 Suppl 2):II3-5.

A Review of Enhanced External Counterpulsation Clinical Trials

Enhanced External Counterpulsation: Mechanism of Action

Current Use of Enhanced External Counterpulsation and Patient Selection
Treatment Options for Angina Pectoris and the Future Role of Enhanced External Counterpulsation

Ongoing and Planned Studies of Enhanced External Counterpulsation

Enhanced External Counterpulsation - A Therapeutic Option for Patients with Chronic Cardiovascular Problems

Enhanced External Counterpulsation as Treatment for Chronic Angina in Patients with Left Ventricular Dysfunction: A Report from the International EECP Patient Registry (IEPR)

Left Ventricular Systolic Unloading and Augmentation of Intracoronary Pressure and Doppler Flow During Enhanced External Counterpulsation

Experience with Enhanced External Counterpulsation (ECP) in Coronary Artery Disease

Enhanced External Counterpulsation in Patients with Heart Failure: A Multicenter Feasibility Study

Relation of the Pattern of Diastolic Augmentation During a Course of Enhanced External Counterpulsation (EECP) to Clinical Benefit [from the International EECP Patient Registry (IEPR)]

Comparison of Patients Undergoing Enhanced External Counterpulsation and Percutaneous Coronary Intervention for Stable Angina Pectoris

Effects of Enhanced External Counterpulsation on Stress Radionuclide Coronary Perfusion and Exercise Capacity in Chronic Stable Angina Pectoris

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

Acute and Chronic Hemodynamic Effects of Enhanced External Counterpulsation in Patients with Angina Pectoris

Acute Hemodynamic Effects and Angina Improvement with Enhanced External Counterpulsation
A Report from the International Enhanced External Counterpulsation Registry (IEPR)

Benefit and Safety of Enhanced External Counterpulsation in Treating Coronary Artery Disease Patients with a History of Congestive Heart Failure

Changes in Ocular Blood Flow Velocities During External Counterpulsation in Healthy Volunteers and Patients with Atherosclerosis

Enhanced External Counterpulsation Improved Myocardial Perfusion and Coronary Flow Reserve in Patients with Chronic Stable Angina; Evaluation by 13N-Ammonia Positron Emission Tomography

Safety and Effectiveness of Enhanced External Counterpulsation in Improving Angioplasty Restenosis

Effects of Enhanced External Counterpulsation on Rennin-Angiotensin System on Experimental AMI

Predictors of Adverse Outcomes in Treating Angina Patients with Enhanced External Counterpulsation

The International EECP Patient Registry (IEPR): Design, Methods, Baseline Characteristics and Acute Results

Does Higher Diastolic Augmentation Predict Clinical Benefit from Enhanced External Counterpulsation?: Data from the International EECP Patient Registry (IEPR)

Numerical Simulation of Enhanced External Counterpulsation

Psychosocial Effects of Enhanced External Counterpulsation in the Angina Patient: A Second Study

Enhanced External Counterpulsation in Unrevascularizable Patients
Enhanced External Counterpulsation Improves Exercise Tolerance, Reduces Exercise-Induced Myocardial Ischemia and Improves Left Ventricular Diastolic Filling in Patients with Coronary Artery Disease

Enhanced External Counterpulsation for Chronic Myocardial Ischemia
Lawson WE, Hui JCK.

Comparison of Hemodynamic Effects of Enhanced External Counterpulsation and Intra-Aortic Balloon Pumping in Patients with Acute Myocardial Infarction
Taguchi I, Ogawa K, Oida A, Abe S, Kaneko N, Sakio H.

Treatment Benefit in the Enhanced External Counterpulsation Consortium
Lawson WE, Hui JCK, Lang G.

Noninvasive Revascularization by Enhanced External Counterpulsation: A Case Study and Literature Review
Singh M, Holmes Jr. DR, Tajik AJ, Barsness GW.

Long-Term Prognosis of Patients with Angina Treated with Enhanced External Counterpulsation: Five-Year Follow-Up Study
Lawson WE, Hui JCK, Cohn PF.
Clinical Cardiology. 2000 Apr;23(4):254-258.

EECP Therapy Continues to Demonstrate Potential as a Treatment for Chronic Angina
Lang M. Cardiovascular Disease Management. 1999 Nov.

Pneumatic External Counterpulsation: A New Noninvasive Method to Improve Organ Perfusion

External Counterpulsation Increases Capillary Density During Experimental Myocardial Infarction
Huang W, Chen YC, Zheng ZS, Zhong WF, Lawson W, Hui J.
Reprinted from the International Proceedings Division of the XXI Congress of the European Society of Cardiology. 1999 Aug 28-Sep 1; Barcelona, Spain:349-353.

Enhanced External Counterpulsation: The Howard County Experience in the First 18 Patients
Gloth S, Oken HA.

Enhanced External Counterpulsation
Caldwell CR, St. Pierre M, Talley JD.

The Multicenter Study of Enhanced External Counterpulsation (MUST-EECP): Effect of EECP on Exercise-Induced Myocardial Ischemia and Anginal Episodes
Arora RR, Chou TM, Jain D, Fleishman B, Crawford L, McKiernan T, Nesto R.

Improvement of Regional Myocardial and Coronary Blood Flow Reserve in a Patient Treated with Enhanced External Counterpulsation: Evaluation by Nitrogen-13 Ammonia PET
Masuda D, Nohara R, Inada H, Hirai T, Li-Guang C, Kanda H, Inubushi M, Tadamura E, Fujita M, Sasayama S.
Enhanced External Counterpulsation in the Management of Patients with Cardiovascular Disease

Enhanced External Counterpulsation as a New Treatment Modality for Patients with Erectile Dysfunction

Prior Revascularization Increases the Effectiveness of Enhanced External Counterpulsation

Maximizing the Hemodynamic Benefit of Enhanced External Counterpulsation

Enhanced External Counterpulsation

Historical Review of the Development of Enhanced External Counterpulsation Technology and its Physiologic Rationale

Case Studies: Enhanced External Counterpulsation

The Emerging Role of Enhanced External Counterpulsation in Cardiovascular Disease Management

Psychosocial Aspects of Enhanced External Counterpulsation

Enhanced External Counterpulsation: U.S. Clinical Research

Enhanced External Counterpulsation: Chronicle of a New Approach to the Therapy of Angina Pectoris

Enhanced External Counterpulsation: A New Therapeutic Option for Patients Who Have Failed Coronary Angioplasty and/or Bypass Surgery

New Therapy Provides Non-Invasive Revascularization

Enhanced External Counterpulsation as an Adjunct to Revascularization in Unstable Angina
Improved Exercise Tolerance Following Enhanced External Counterpulsation: Cardiac or Peripheral Effect?

Can Angiographic Findings Predict which Coronary Patients will Benefit from Enhanced External Counterpulsation?

Psychosocial Effects of Enhanced External Counterpulsation in the Angina Patient

Three-Year Sustained Benefit from Enhanced External Counterpulsation in Chronic Angina Pectoris

Enhanced External Counterpulsation in the Treatment and Rehabilitation of Coronary Patients in Indonesia

Role of Enhanced External Counterpulsation in Angina Treatment

Efficacy of Enhanced External Counterpulsation in the Treatment of Angina Pectoris

New Sequential External Counterpulsation for the Treatment of Acute Myocardial Infarction