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# **EECP THERAPY**

**American College of Cardiology  
Rhode Island Chapter  
Primary Care Symposium**

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**September 29, 2010**

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# Refractory Angina: Extent of Problem

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- ❑ 6.4 Million Angina Patients in US
- ❑ 50,000 New Pts Annually with Refractory Angina (Persistent despite Meds/PCI/CABG)
- ❑ >2,000 RI pts with Refractory Angina
- ❑ COURAGE Trial: >50% pts in both PCI/Medical Rx groups had persistent angina at 3 yrs

# EECP Procedure

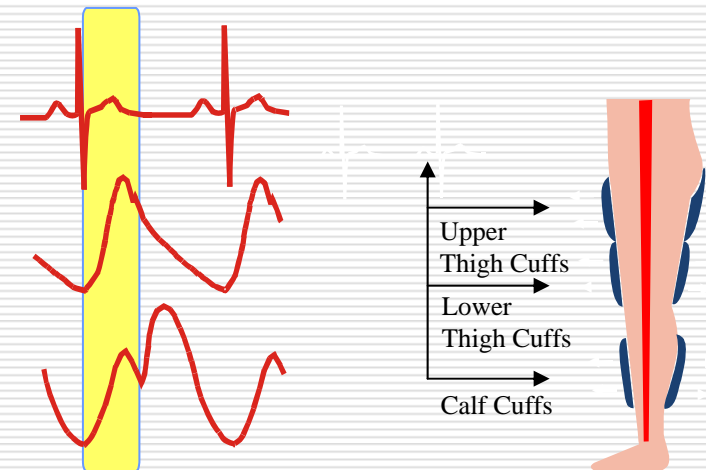
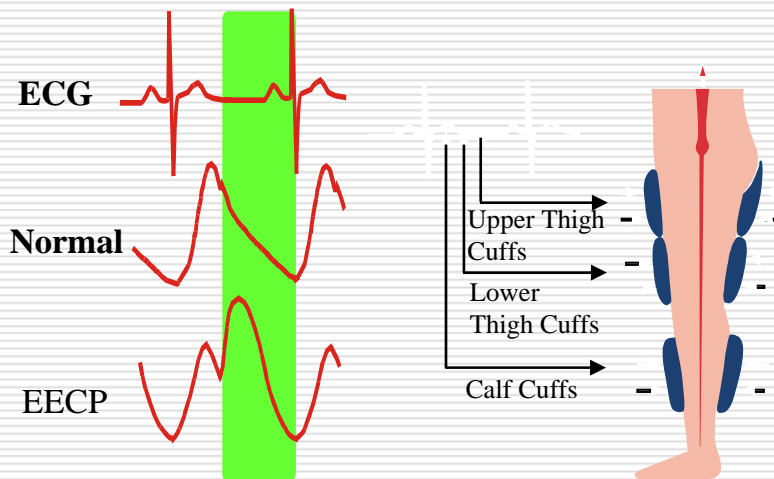
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# Principles of Operation

## Diastolic Inflation/Systolic Deflation

Diastolic Pressure Augmentation as well as Increased Venous Return



Effects:



Effect:

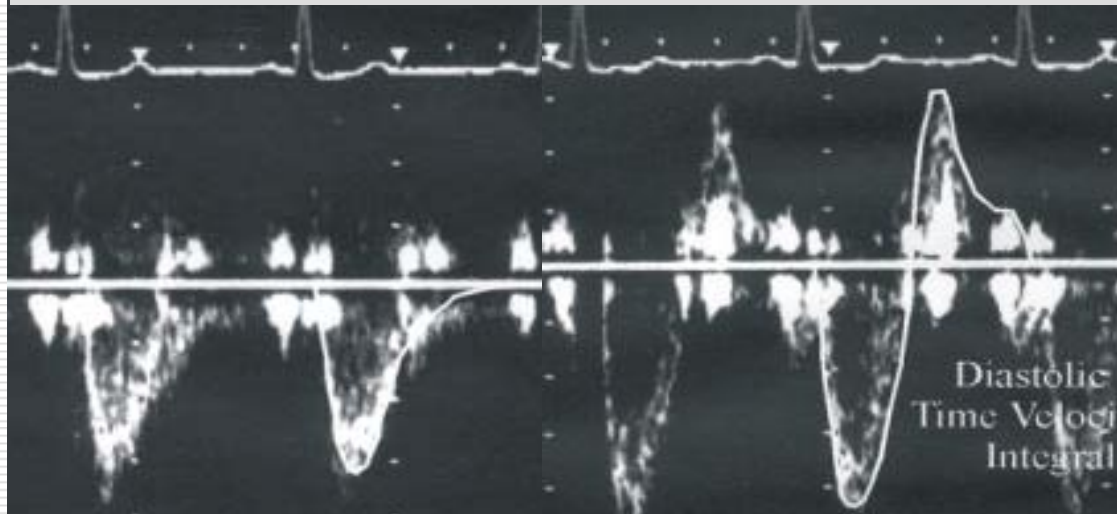


# Diastolic Pressure Augmentation/ Inc. Cardiac Output During EECp

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Increase Cardiac Output

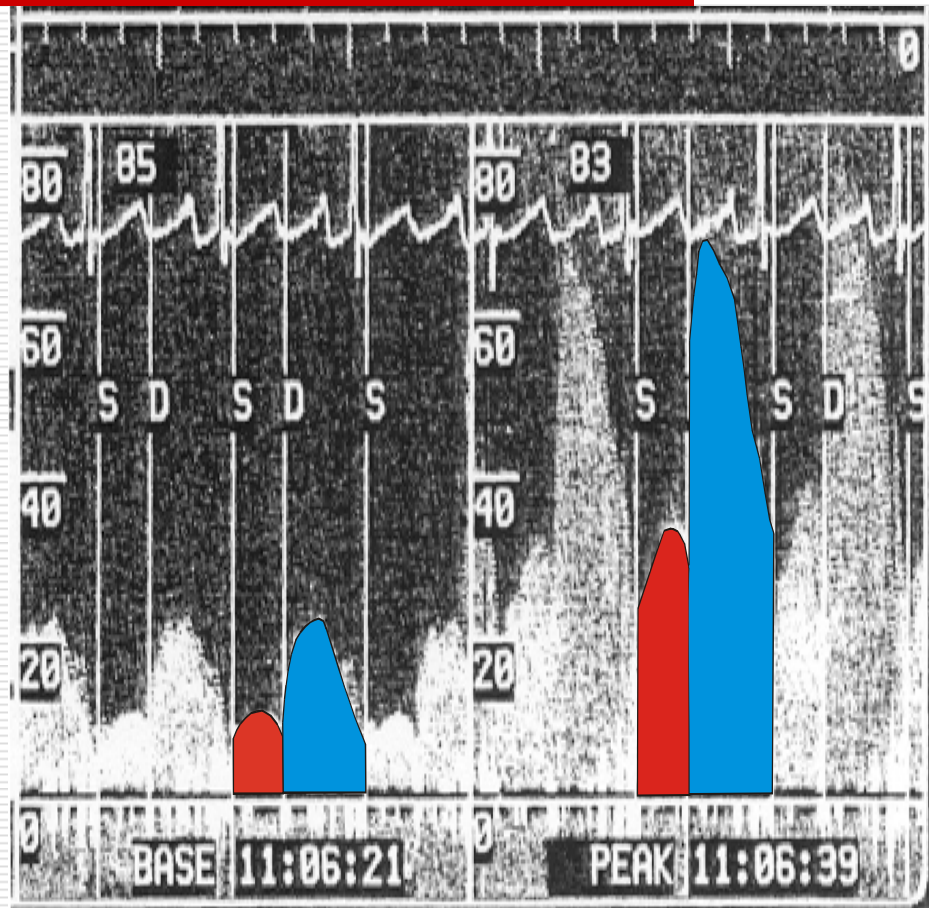
Duplex echocardiography Descending Aorta



Lawson, Hui: J of Critical Illness 2000;5:629-636

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# Doppler Flow Velocities obtained with FloWire in the LAD



# EECP Postulated Mechanisms of Action: Human and Animal Studies

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- ❑ Recruitment of collateral coronary vessels
  - ❑ Improved Endothelial Function
  - ❑ Reduction of inflammation
  - ❑ Improved flow-mediated vasodilation
  - ❑ Training-like effect on legs
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# EECP Clinical Studies: Summary

--Over 150 Peer reviewed studies published

--2 International Registries with over 8,000 patients

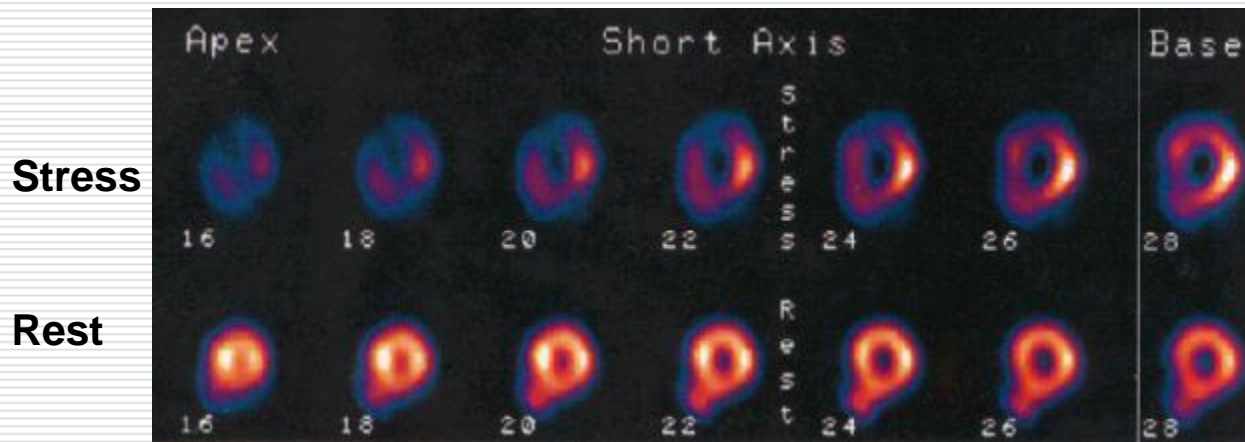
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- Decreased frequency of angina (>80% pts down one angina class)
  - Increased exercise duration and time to ST depression
  - Reduced nitrate use
  - Increased quality of life
  - Benefits maintained 3 years in 74%
  - CHF: improved exercise tolerance, QOL, fct class (but no change peak VO<sub>2</sub>; Medicare requested larger trial and did not expand payment policy)
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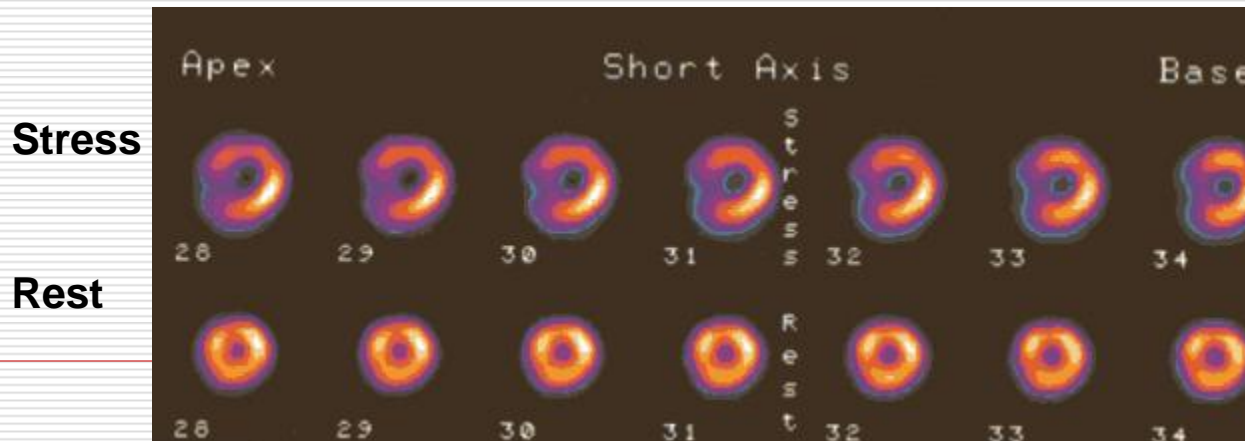


# Cardiolite Stress Test Before/After EECp

## Pre-EECP



## Post-EECP



# EECP Case Summary #1

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- ❑ V.D.; 84 y/o male
  - ❑ Diffuse 3-CAD; multiple prior percutaneous interventions; moderate AS; no re-vasc options
  - ❑ Anti-anginal meds: Isosorbide, metoprolol, amlodipine
  - ❑ Angina causing significant lifestyle limitation
  - ❑ Underwent 35 EECP treatments
  - ❑ Pt states no further CP; wife reports him running on stairs past her on chair lift
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# EECP Case Summary #2

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- ❑ J.L.; 64 y/o female, diabetic
- ❑ Angina requiring proph NTG for exercise; lateral ischemia on nuc stress; triple anti-anginal Rx
- ❑ Cath: 90% ostial diagonal lesion; too small for intervention
- ❑ Underwent 35 EECP treatments
- ❑ Reports exercise tolerance increased; no NTG use; "feels 15 yrs younger"

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We do not typically re-stress these  
pts since improved symptoms are  
Rx endpoint

# EECP Approvals/Recommendations

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- ❑ FDA Approved for Class II,III,IV angina and for Class II,III CHF treatment
- ❑ Medicare approved for Class III,IV angina (non-revascularizable)
- ❑ RI BC, United reimburse
- ❑ ACC/AHA 2002 Chronic Stable Angina Guidelines: Class IIb; Level of Evidence B (No change 2007; update due late 2010)

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2B: Benefit > Risk; May be considered; more studies needed to better establish

# EECP Contraindications

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- Arrhythmias interfering with machine triggering
  - Bleeding disorders (therapeutic warfarin OK)
  - Active thrombophlebitis
  - Severe PVD
  - AAA requiring repair
  - Pregnancy
  - Severe aortic insufficiency
  - Uncontrolled HTN
  - Severe pulmonary HTN
  - Uncontrolled volume overload
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# Prominent Centers Offering EECPP

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- Mayo Clinic (Wide Use for Microvascular Angina)
  - Cleveland Clinic
  - University of Pittsburgh
  - Beth Israel Medical Center
  - Stony Brook
  - Minneapolis Heart Institute
  - University of California San Francisco
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# Conclusions:

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- ❑ Large numbers of patients endure lifestyle limiting angina
  - ❑ EECP is a safe and effective noninvasive treatment option
  - ❑ Patients feel better! They have increased energy and become more active
  - ❑ Available in RI – CINE South County Cardiology Division, North Kingstown
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