

# Transdermal Estradiol and Progesterone Improve Mood Indicators, Quality of Life and Biomarkers of Cardiovascular Disease in Perimenopausal and Postmenopausal Women

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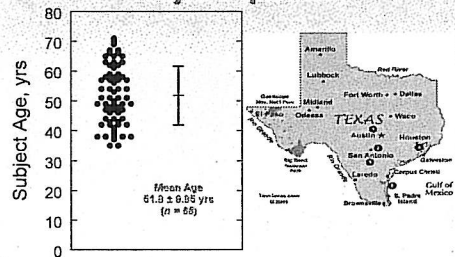
## Introduction

40 million US women suffer from perimenopausal/menopausal symptoms, and there is cause for concern in using conventional HRT due to adverse risks determined by the WHI. In sharp contrast to experimental data, which reveals favorable effects of estradiol and progesterone on vascular biology and physiology, oral conjugated equine estrogens and medroxyprogesterone acetate failed to demonstrate a cardioprotective effect of HRT in the WHI and HERS. Our study investigates the effects of transdermal estradiol and progesterone on mood indicators of anxiety, depression, quality of life (QOL) and biomarkers of cardiovascular disease (CVD)

## Methods

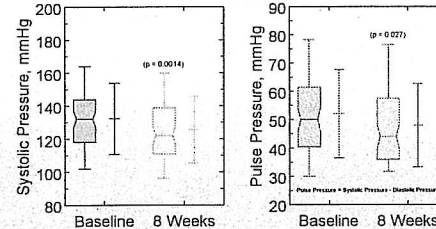
150 women of Caucasian, Black, Native American and Hispanic ethnic descent (mean age 51.8 yrs) who met strict inclusion & exclusion criteria were enrolled in our prospective, case-controlled study (75 controls, 75 interventional). The 8-week effects of low dose daily transdermal progesterone and estradiol therapy on mood, quality-of-life, and gender-specific biomarkers of cardiovascular disease were measured.

### Age and Demographic Distribution of Subject Population

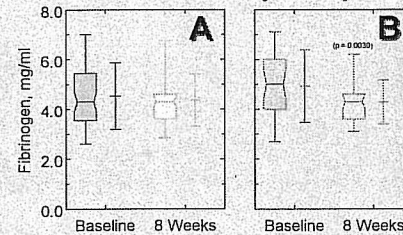


## Results

### Blood Pressure Significantly Decreased at 8 Weeks

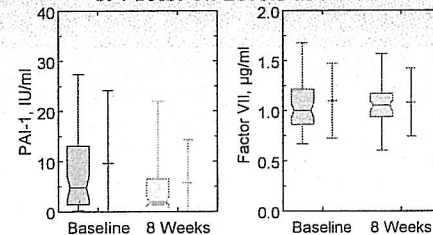


### Fibrinogen Levels Significantly Decreased in Women > 50 yrs of Age

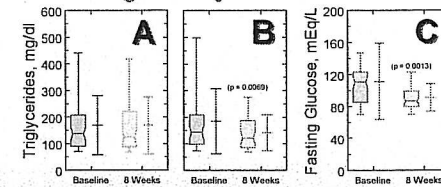


Panel A) Fb in total subject population was unchanged. Panel B) Fb in subjects > 50 yrs of age was significantly reduced.

### No Significant Change in PAI-1 Activity or Factor VII Levels at 8 Weeks

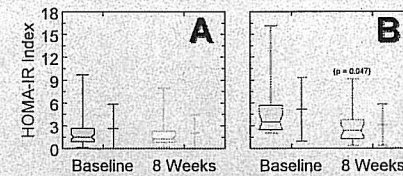


### Triglycerides in Postmenopausal Women Significantly Reduced at 8 Weeks



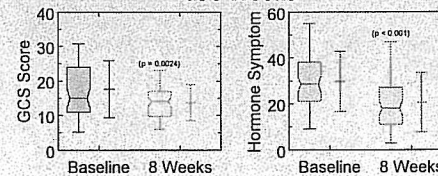
Panel A) TG in total subject population was unchanged. Panel B) TG in postmenopausal women was significantly reduced. Panel C) Fasting blood glucose was significantly reduced in total subject population at 8 weeks.

### HOMA-IR Index Significantly Decreased in Women with Insulin Resistance

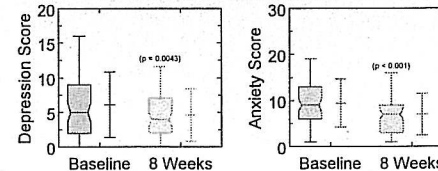


Panel A) Index in total subject population was unchanged. Panel B) Index in subjects with insulin resistance was significantly reduced at 8 weeks.

### Quality-of-Life Scores Significantly Improve at 8 Weeks



### Depression and Anxiety are Significantly Reduced at 8 Weeks



### Summary of Data (Means ± SD)

Indicator	Baseline	8 Week	p-Value*
Systolic BP, mmHg	132 ± 21	125 ± 20	0.0014
Diastolic BP, mmHg	80 ± 11	78 ± 16	0.37
Pulse Pressure, mmHg	52 ± 16	48 ± 15	0.027
Fibrinogen, mg/ml (total pop.)	4.5 ± 1.3	4.4 ± 1.1	0.28
Fibrinogen, mg/ml (>50 yrs)	4.9 ± 1.5	4.3 ± 0.9	0.0030
PAI-1, IU/ml	9.6 ± 14.6	5.8 ± 8.5	0.051
Factor VII, µg/ml	1.10 ± 0.37	1.08 ± 0.34	0.24
Triglycerides, mg/dl (total pop.)	169 ± 112	169 ± 107	0.97
Triglycerides, mg/dl (PMW)	185 ± 122	141 ± 68	0.0069
Fasting Glucose, mEq/L	111 ± 48	91 ± 17	0.0013
HOMA-IR index (total pop.)	2.6 ± 3.2	2.1 ± 2.4	0.13
HOMA-IR index (w/resistance)	5.1 ± 4.1	3.1 ± 2.7	0.047
Body Mass Index (BMI)	27.7 ± 5.8	27.4 ± 5.9	0.22
Nitric Oxide, µM	4.2 ± 3.2	4.3 ± 5.0	0.080
CRP, mg/ml	6.2 ± 6.2	5.9 ± 5.7	0.47
VEGF, pg/ml	99.1 ± 340.8	99.1 ± 341.2	0.76
MPO, µg/ml	5.5 ± 3.8	6.8 ± 5.2	0.052
MMP-9, ng/ml	81.5 ± 48.8	129.4 ± 40.2	< 0.001
Greene Climacteric score	17.7 ± 8.3	13.7 ± 5.3	0.0024
Hormone Symptom score	29.7 ± 13.1	20.5 ± 12.9	< 0.001
Hamilton Depression score	6.1 ± 4.8	4.6 ± 3.8	0.0043
Hamilton Anxiety score	9.5 ± 5.2	7.0 ± 4.5	< 0.001
Visual Analog Pain Scale	1.4 ± 1.0	1.1 ± 0.9	0.014

\* Paired t-Test. Significant beneficial effects are highlighted in Green and significant adverse effects are highlighted in Red. Significance is based on p-Values less than 0.05.

## Conclusions

Transdermal progesterone and estradiol compounded in an emulsion vehicle demonstrate statistically significant favorable effects on mood indicators, quality of life, and biomarkers for cardiovascular disease risk in perimenopausal and postmenopausal women. The hormone restoration model of care demonstrates the central role of sex steroid hormones in regulatory processing of neuroendocrine, cardiovascular, metabolic and inflammatory functions.