

Results of a Structured Diet, Exercise, & Behavior Modification Intervention in Post-Menopausal Breast Cancer Survivors: *Quality of Life*

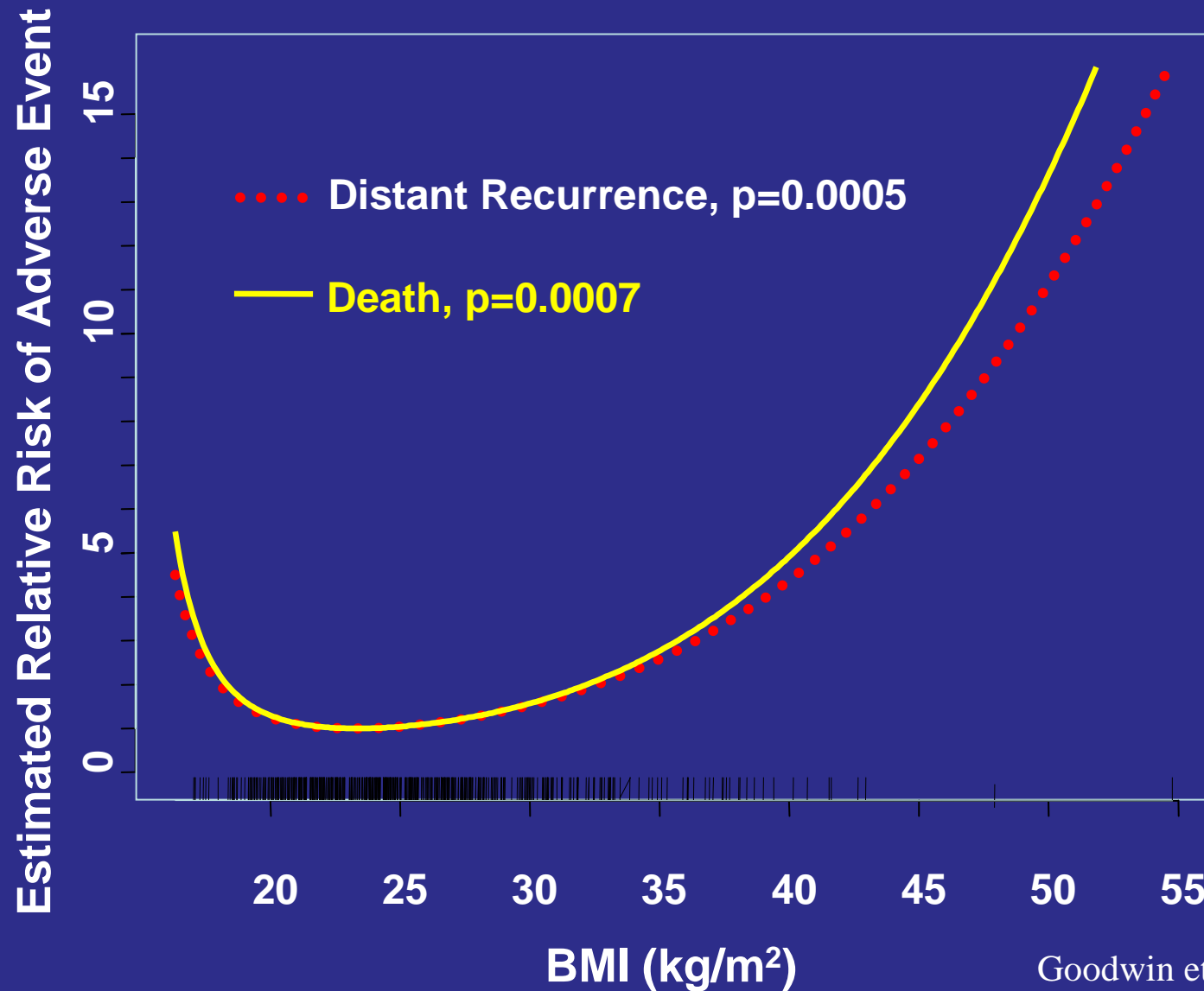
**Jennifer Klemp PhD, MPH
Assistant Professor of Medicine
Division of Clinical Oncology
Director, Cancer Survivorship
University of Kansas Cancer Center
April 2012**

Impact of Weight on Breast Cancer Risk

- Before diagnosis: Overweight and obese postmenopausal women have a 1.3 to 1.5 increased risk of developing breast cancer
- At diagnosis: Obese women have a 1.5 to 2.5 increased risk of recurrence or death
- After diagnosis: Women who gain weight (13 lbs+) have 1.5 increased risk of recurrence or death



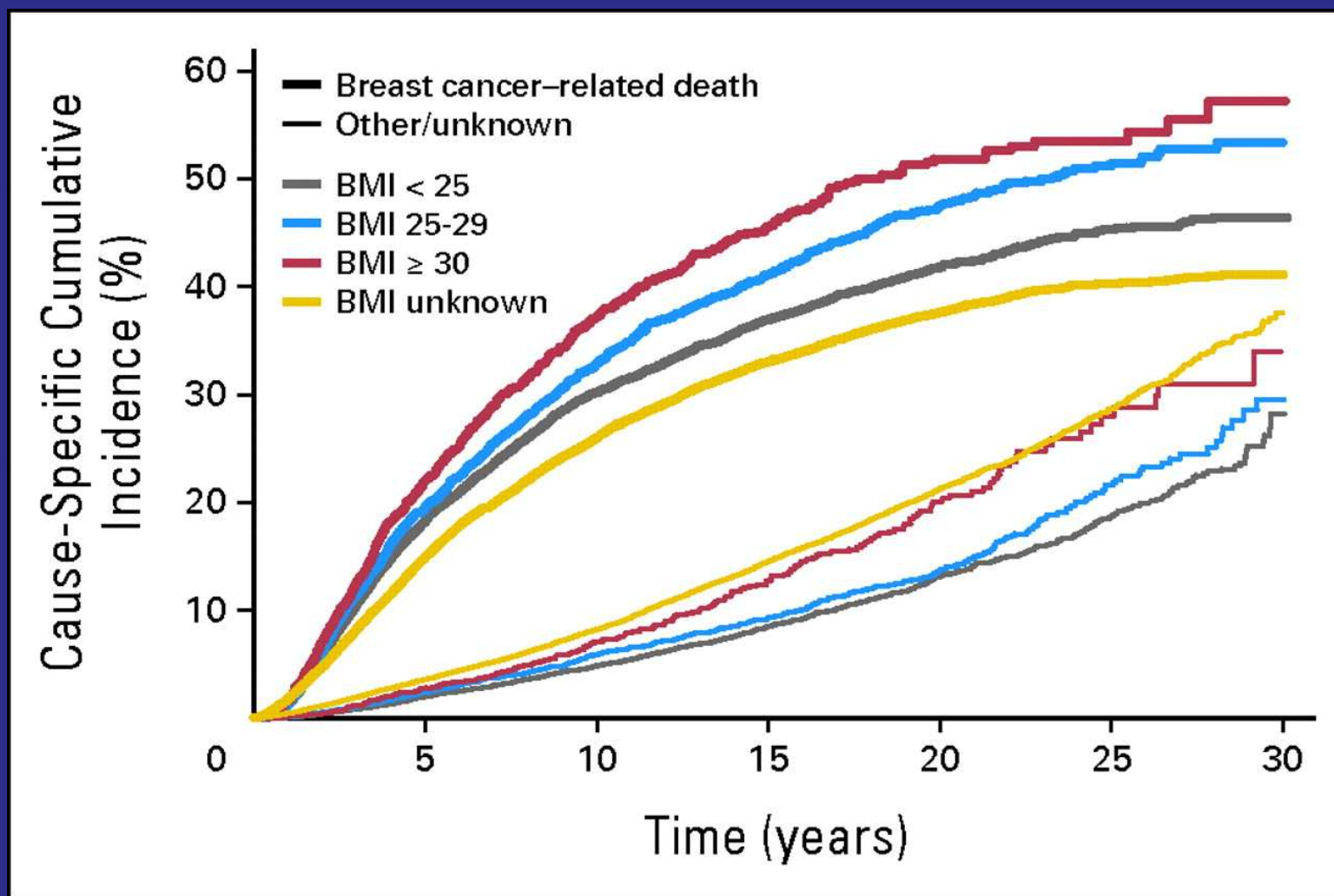
Weight, Recurrence, & Survival in Early-Stage Breast Cancer



Goodwin et al, *JCO* 2002

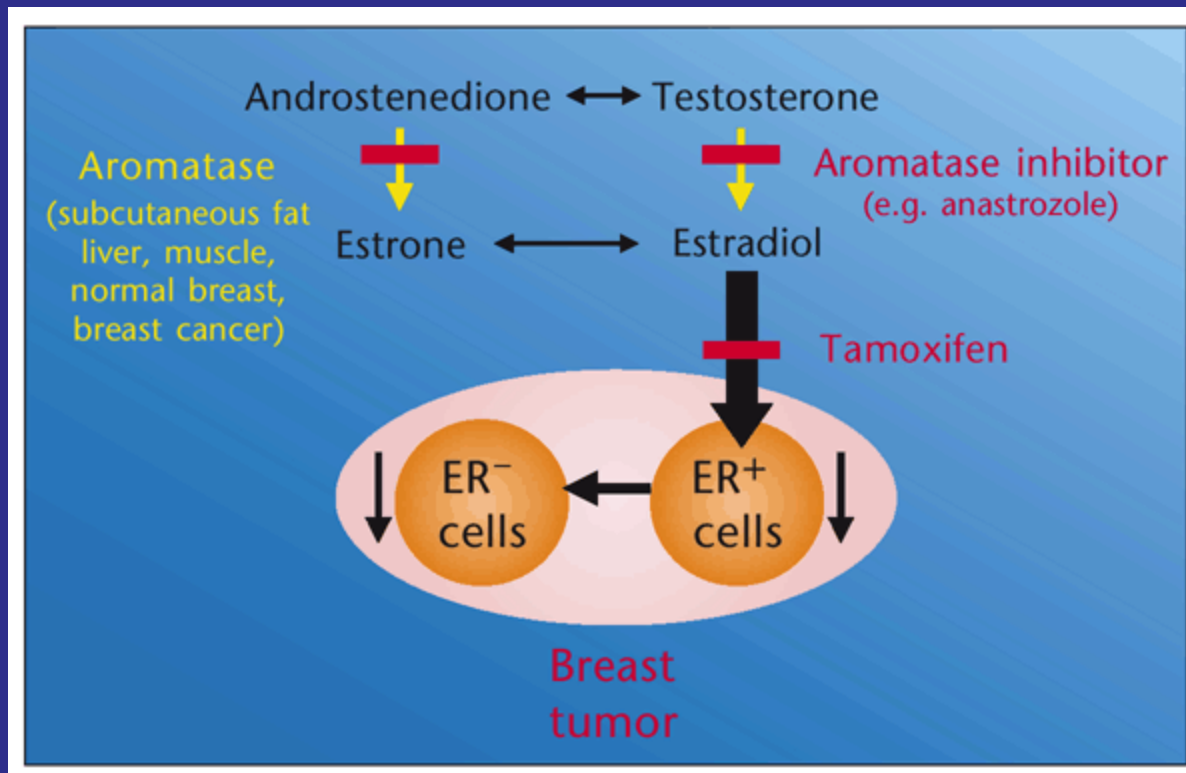
Deaths From Breast Cancer and Other Causes Increased in Overweight Women

53,816 with Early-Stage Breast Cancer in Denmark 1977 to 2006.

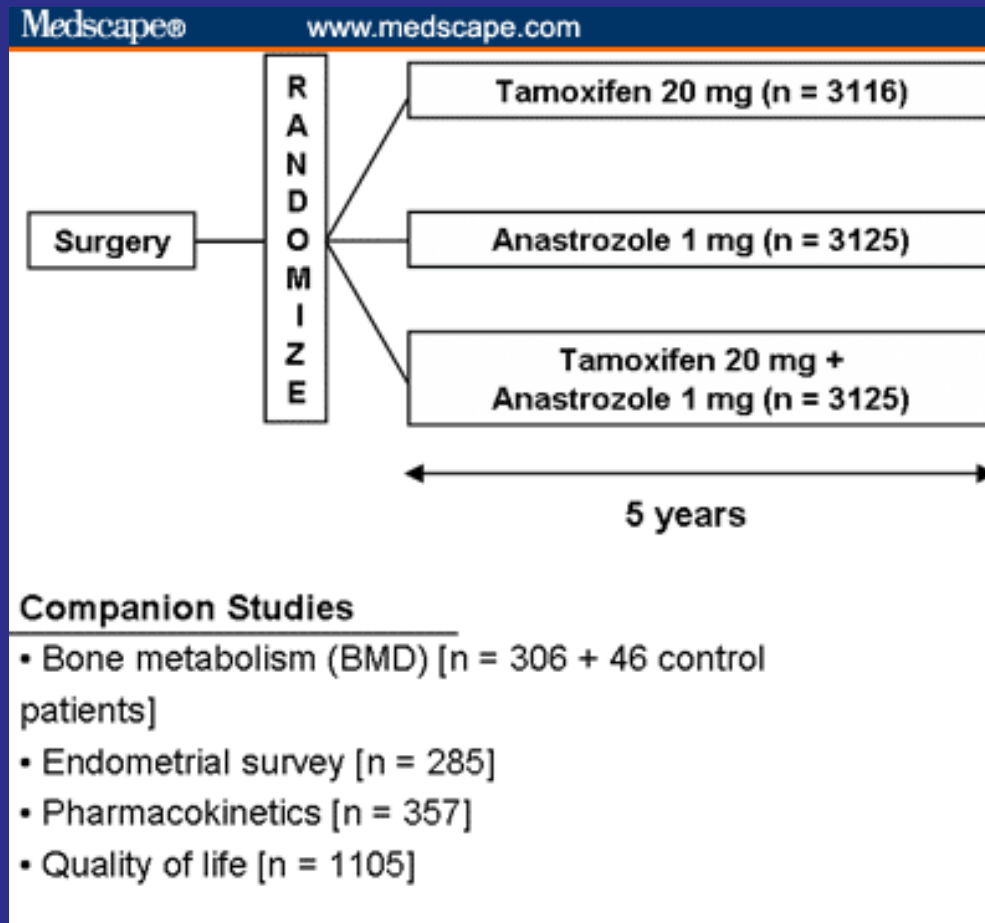


75% of Breast Cancers are Estrogen Receptor Positive

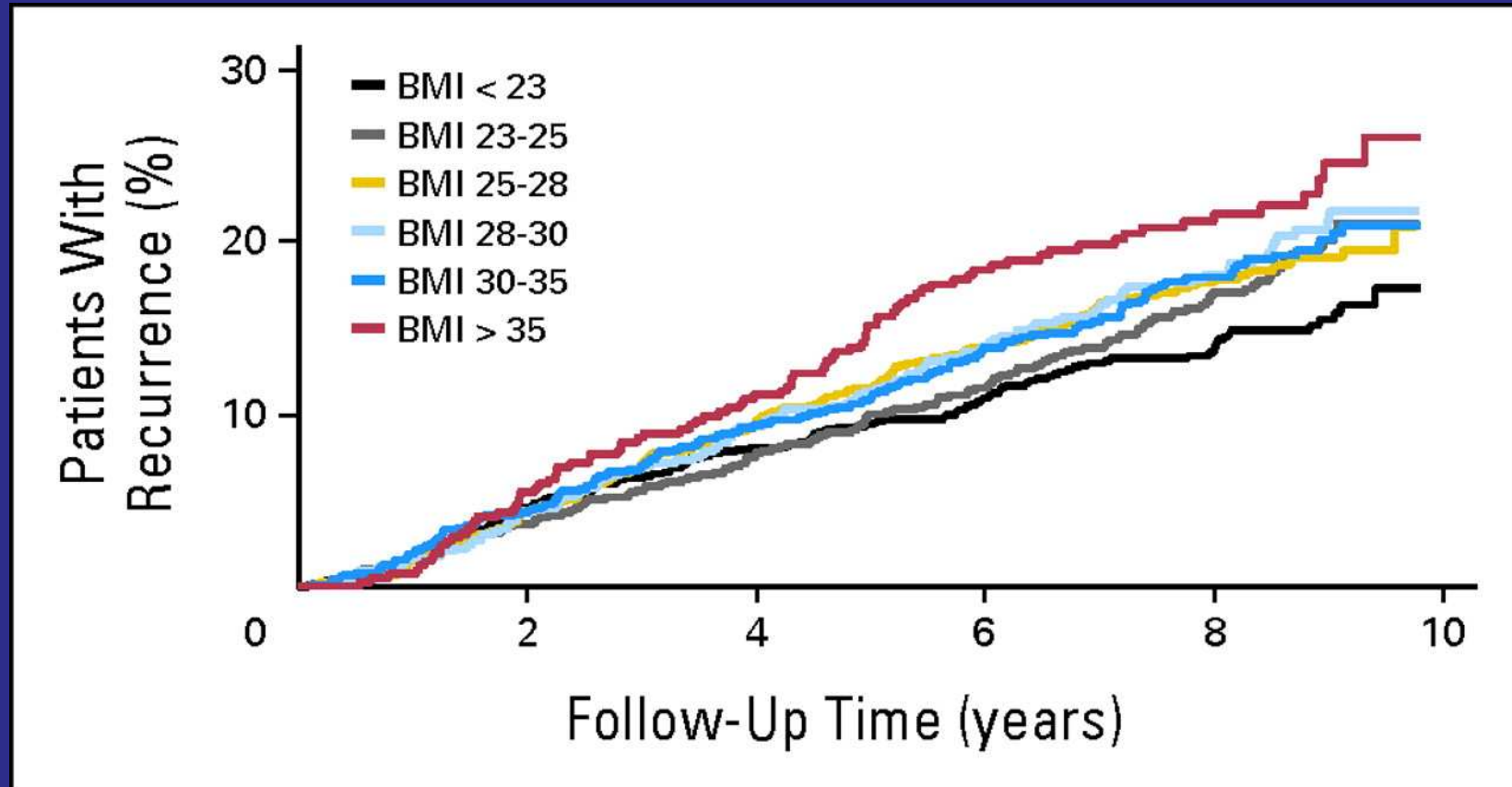
estrogen (and progesterone) stimulate growth by "turning on" hormone receptors in the breast cancer cells. Without these hormones, the cancer cells are not stimulated to grow



ATAC -- Arimidex, Tamoxifen Alone or in Combination



ATAC : Recurrences Greater with Increasing BMI



Obesity Associate With Poorer Long Term Outcomes

- AIs may not have an advantage over tamoxifen in overweight and obese women
- Obesity effect may be most pronounced in women with ER+ tumors and may not show significance for 10 yrs.
- Obese women have larger tumors and more co-morbidities.
- Taking these factors into account they have higher distant recurrence rates, worse disease free, disease specific and overall survival.

Step 1: Weight Management for Rural Breast Cancer Survivors

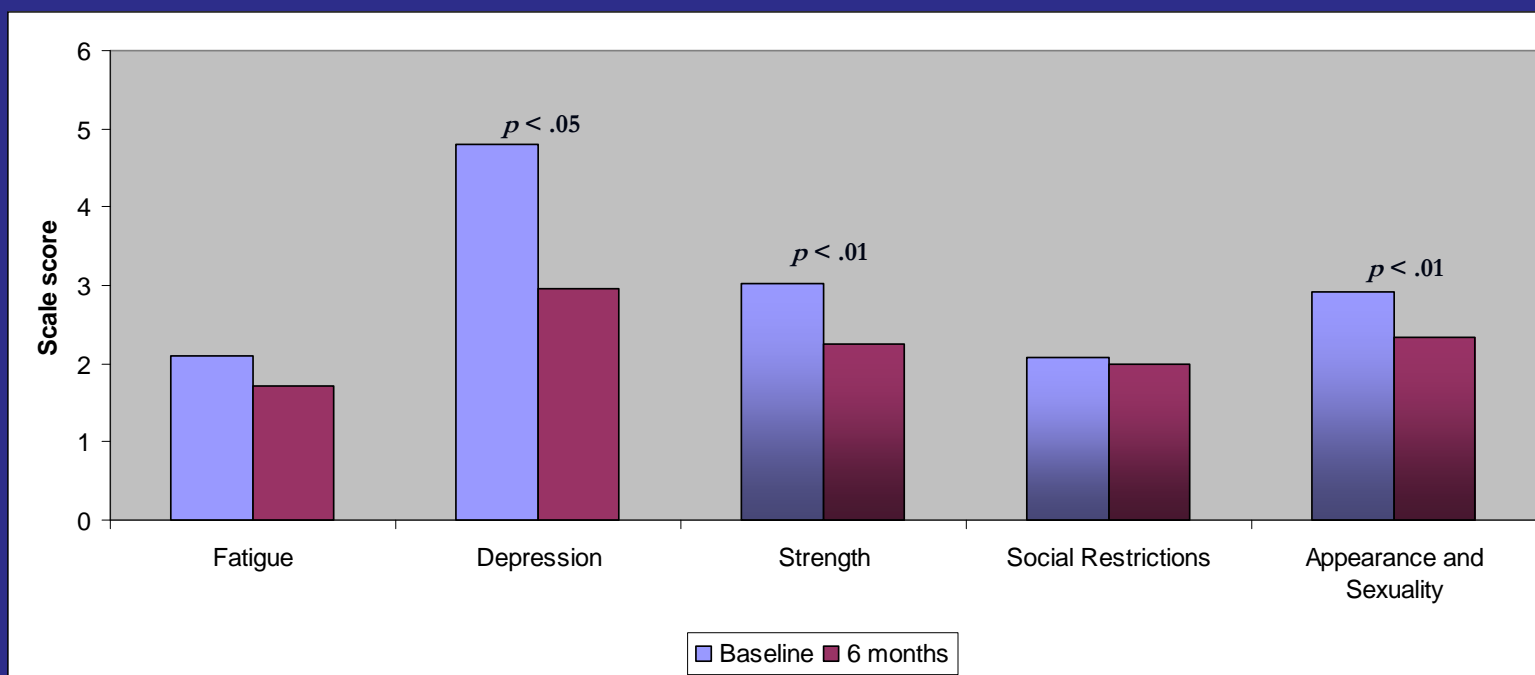


Pilot showed significant 6-month changes across multiple outcomes

Weight and waist	
Weight	-27.5 lbs
% Weight loss	13.9%
Waist	-9.4 cm
Diet and Physical Activity	
PA kcal/week	+1235
Diet kcal/day	-349
FV servings/day	+3.7
% kcal from fat	-12.6
Biomarkers	
Insulin	-16.7%
Leptin	-37.1%

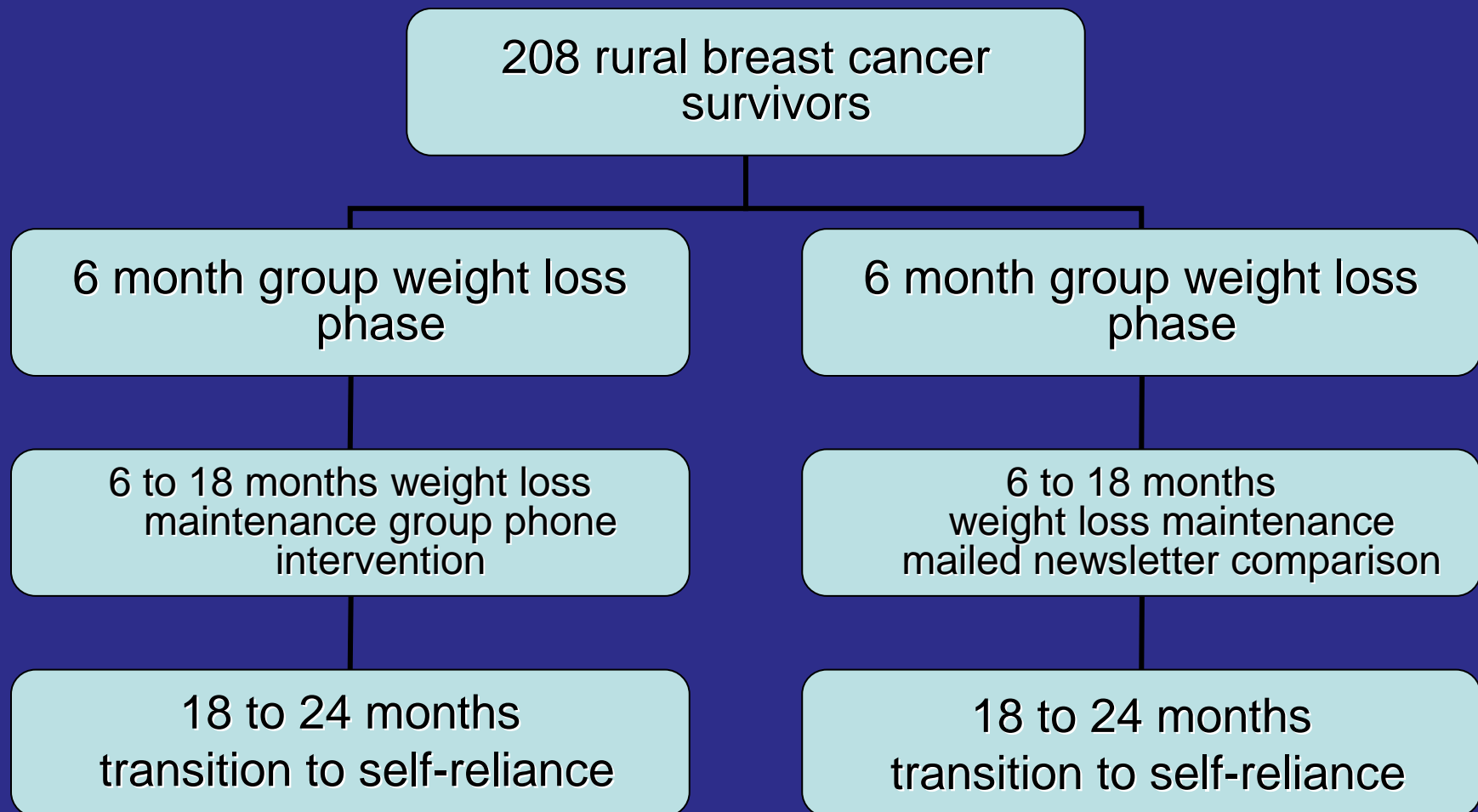
Befort et al., Breast Cancer Res Treat, 2012; 132: 631-639

Quality of life changes among rural breast cancer survivors enrolled in 6 month weight loss program



Mean weight loss = 13.9%, 90% session attendance

Enrolling now into 5 year study



Step 2: Develop and Test a Structured Diet, Exercise, & Behavior Modification Program for Breast Cancer Survivors



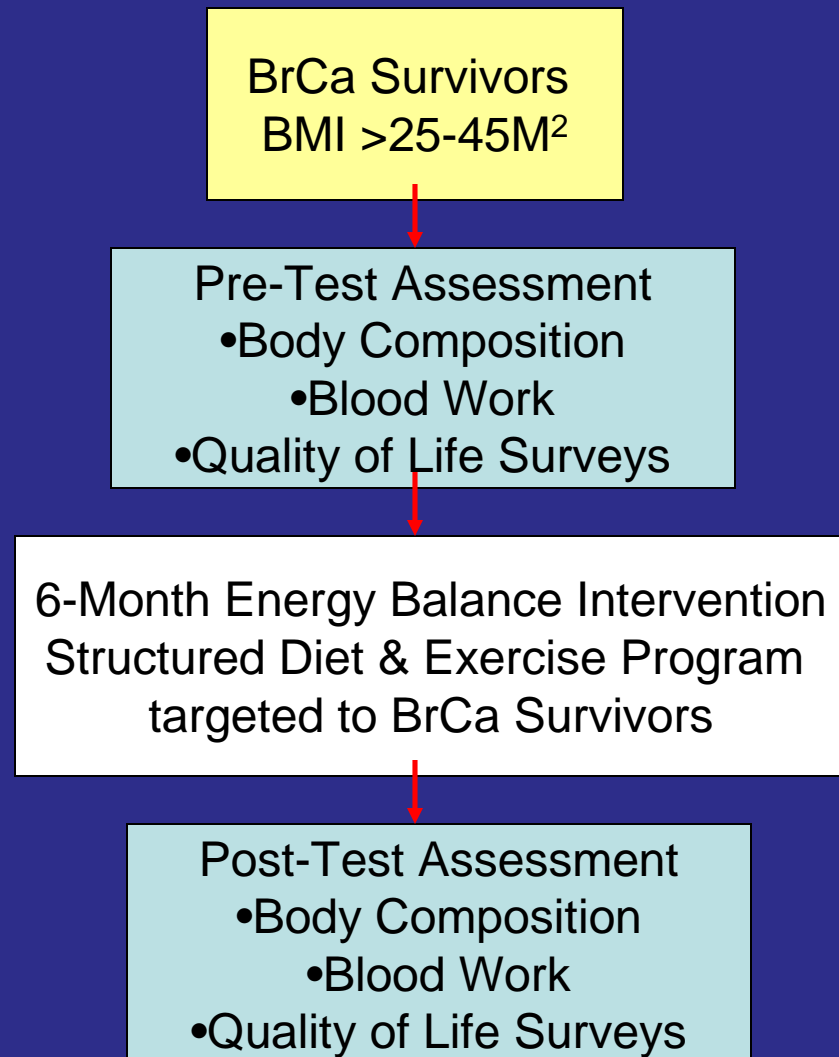
Study Objectives

- Primary Objective:
 - To determine if overweight, post-menopausal breast cancer survivors will participate and adhere to a diet/exercise/behavioral modification program and lose 5% of their weight.
- Secondary Objective:
 - To determine if post-menopausal BrCa survivors who participate in a structured diet/exercise/behavioral modification demonstrate modulation on markers of breast cancer risk and quality of life.

Trial Design

- Pilot Study
- Single institution:
 - Breast Cancer Survivorship Center
- Post-Menopausal BrCa Survivors
- \geq 3-months from treatment (surgery, chemotherapy, XRT)
 - Can be on anti-hormonal therapy (> 6 months)
- Physician release to participate in the *Energy Balance Study*
- Recruitment time: 1 year

Breast Cancer Risk Biomarkers and Energy Balance in Post-Menopausal Breast Cancer Survivors



Baseline and Follow-up Measures

- Body composition
 - Height
 - Weight
 - Waist and hip circumferences
 - Total Body Composition: DEXA scan
- Quality of Life
 - BCPT Symptom Check List (breast cancer symptom checklist)
 - SF36 (health related quality of life)
 - PHQ-9 (measure of depression)
 - Brief Fatigue Inventory
- Serum- fasting blood draw
 - Hormones: bioavailable estradiol, estrone, estrone sulfate, SHBG, testosterone, prolactin, FSH, interleukin-6, IGF1, and IGFBP3,
 - Cholesterol, glucose
 - Bank lymphocytes for gene expression

Baseline and Follow-up Measures

- Chart Review/Physician Verification/Medical Tests
 - Medical history
 - Blood pressure, pulse, temperature
- Diet
 - 3 day food log (including 1 work day:2 weekend days)
 - Daily dietary intake log: # of shakes, pre-packaged meals, fruits/vegetables
- Physical Exercise
 - Fitness assess: resting and active
 - Daily Activity Log- minutes & type/intensity of activity
 - Pedometers- Step Count

Intervention

- Calorie Controlled (1200-1600 cal/day)
 - 2 pre-packed meals/day
 - 3 Low Calorie/High Protein shakes/day
- Exercise
 - Aerobic
 - Resistance Training
 - Assessment & Instruction: ACSM Cancer Certified Trainer
- Curriculum
 - Modified DPP + Content specific to Breast Cancer
 - Topics Highlighting BrCa Late Effects
- Accountability/Group format
 - Weekly weigh-in and meeting (90 minutes)
 - 75% participation required

Total Group Participant Characteristics & Weight Loss, n=52

- Median age = 51
- Median time since diagnosis: 4.25 yrs
- Current anti-hormone therapy = 65%
- Menopausal status at diagnosis: 62% pre-menopausal

	At Diagnosis	Pre- Intervention	Post- Intervention	Change from Pre- to Post- Intervention
Weight (lbs)	187.9	202	178.3	↓ 23.6 lbs (~12% of the starting weight)
BMI (kg/m ²)	31.2	32.6	28.2	↓ 13.5%

Completers

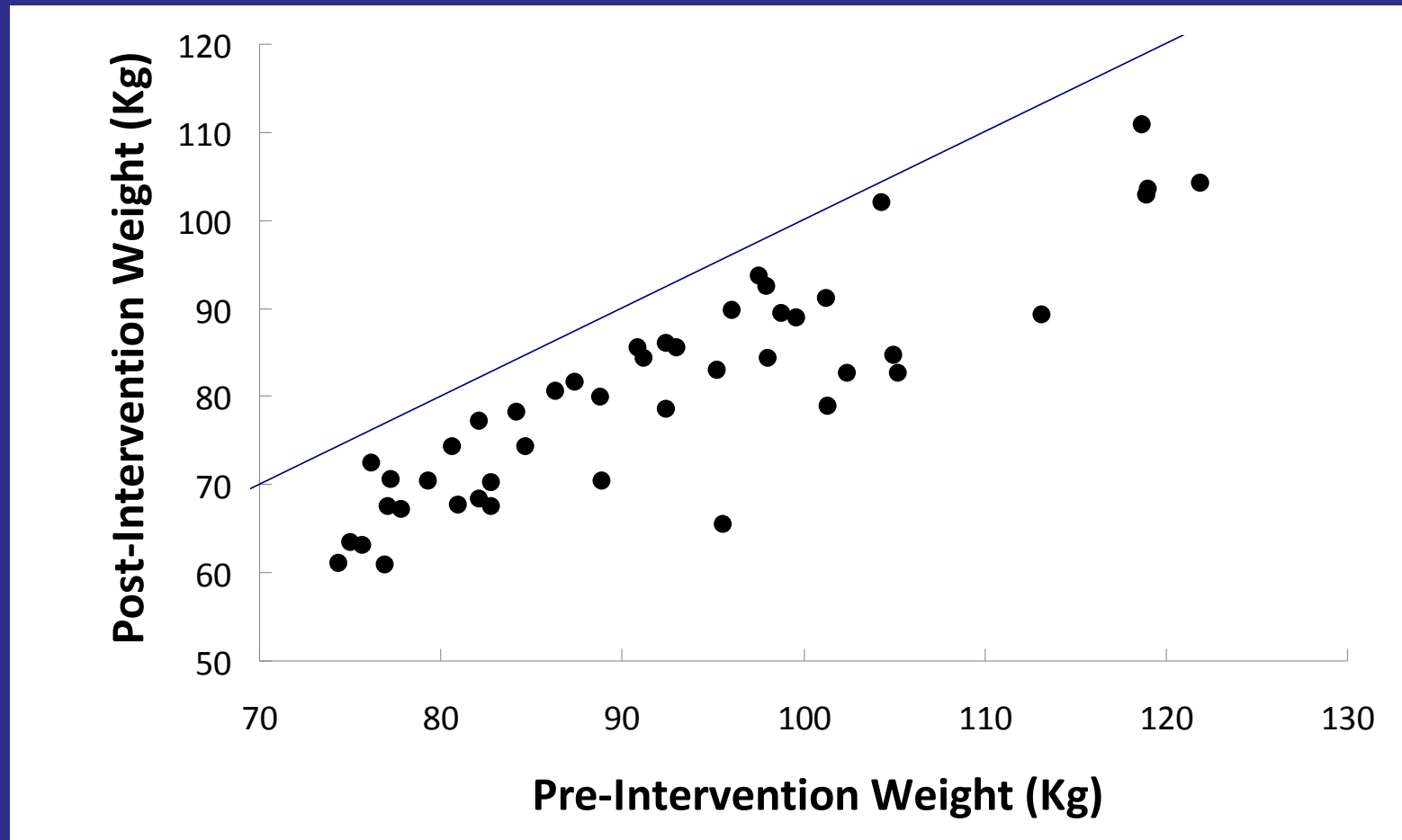
N=45	Characteristic
Age (years +/-SD)	52.9 (7.8)
Time since diagnosis (years +/-SD)	5.7 (4.9)
Weight at Diagnosis (kg)	84.1 (15.4)
BMI at Diagnosis (kg/m ²)	31.1 (5.6)
Stage (range 1-3)	2
Surgical Management	
Lumpectomy	20
Mastectomy	25
Radiation	25
Chemotherapy	29
Hormone Receptor Status (ER+)	29
Anti-hormonal Therapy (ever)	29
Current use: aromatase inhibitor	17

Baseline and 6-month measures among study completers

<i>N=45</i>	Baseline Median (SD)	6-month Median (SD)	Absolute Change Median (SD)	Percent Change Median (SD)
Wt (kg)	91.2 (13.0)	81.0 (12.5)	-10.7 (6.1)*	-12.3 (6.1)*
BMI (kg/m ²)	32.2 (4.9)	28.2 (4.6)	-3.8 (2.2)*	-12.4 (6.0)*
Hip (cm)	119.8 (11.0)	109.5 (20.3)	-9.9 (17.5)*	-8.3 (14.1)*
Waist (cm)	98.1 (11.6)	89.0(12.4)	-9.9 (8.8)*	-9.75(8.8)*
Body fat (%)	49.5 (4.0)	45.0 (6.7)	-5.6 (4.5)*	-9.8 (9.4)*

*P=<0.001

Change in Weight Pre to Post Intervention (kgs)

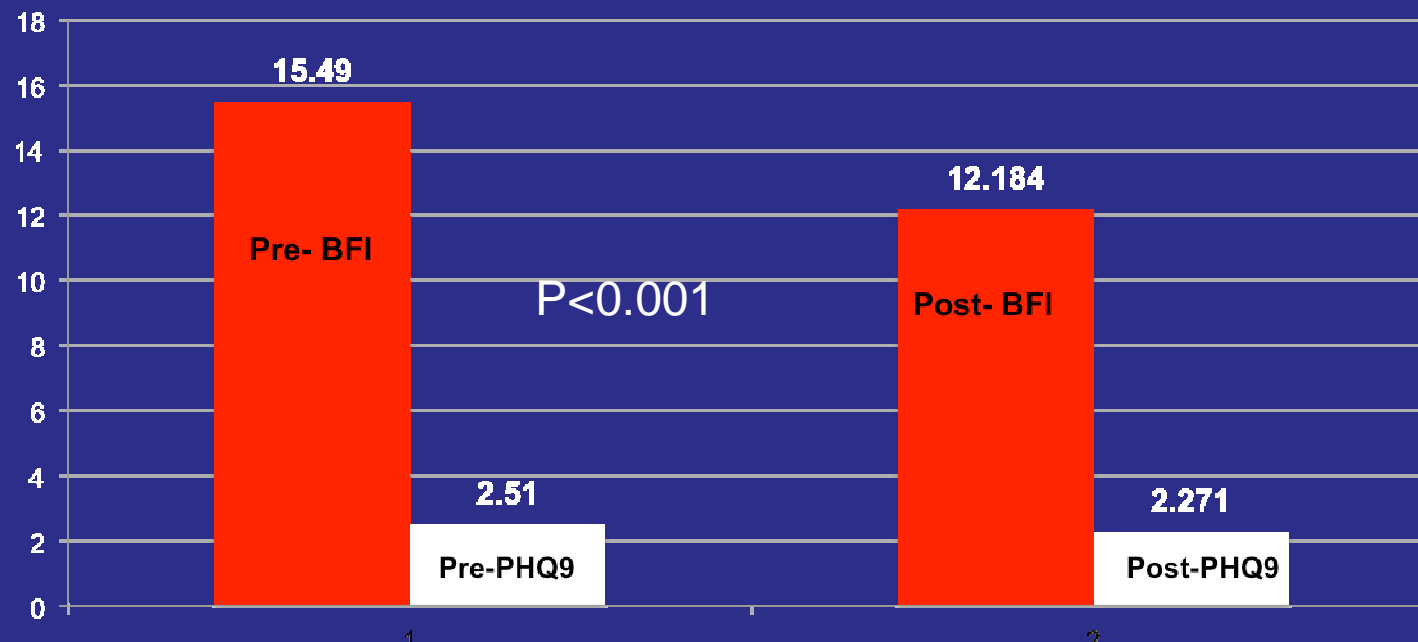


Changes in Serum Biomarkers

Biomarker	Baseline Mean (SD) N=45	6-month Mean (SD) N=45	Absolute Change Mean (SD)	Percent Change Mean (SD)
Insulin (uIU/ml)	11.4(4)	5.4(4.3)	-3.6(6.6)*	-37.6(51.9)*
Glucose (mg/dL)	101.67 (19.9)	94.0 (15.2)	-2.0 (21.0)	-1.0 (10.4)
Leptin (ng/ml)	39.4 (19.4)	15.65 (13.61)	-18.1 (13.7)*	-54.2 (34.5)*
Adiponectin (ug/ml)	8.08 (6.1)	8.251 (6.523.9)	.889 (1.947)*	7.5 (21.2)*
SHBG (nmol/L)	42.8 (28.1)	42.75 (32.74)	7.7 (15.9)*	23.4 (39.4)*
FSH (mIU/ml)	63.8 (34.7)	69.00 (33.28)	2.7 (19.8)*	6.5 (141.0)*
Estradiol (pc/mL)	22.7 (48.8)	8.18 (5.37)	-1.5 (14.1)	-16.9 (68.8)
Free estradiol (pc/mL)	1.8 (1.0)	.56 (.4)	-1.2 (1.0)*	-60.2 (25.7)*

*p<0.05

Significant Changes in Fatigue & Depression



Lower scores on the BFI & PHQ9 were correlated with greater change in % weight loss, p-values =0.037 & 0.004, respectively.

Collaborators

- **Clinical research collaborators**

- Christi Befort, PhD
- Carol Fabian, MD
- Debra Sullivan, PhD
- Qamar Khan, MD
- Bruce Kimler, PhD
- Henry Yeh, PhD

- **Project staff**

- Sonya Cox, RD, MPH
- Katherine Harvey, RD, MS

- **Support**

- Back in the Swing
- NIH BIRCWH K-12

