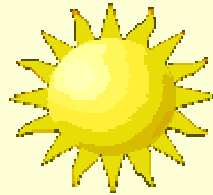



Bouncing back and moving forward:
Progress and challenges for
biopsychosocial research on breast cancer




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Where we are...

- Predictors of distress in women with breast cancer
age, education, stage, marital status, surgery type, family history of breast cancer, psychiatric history, coping styles, social support, monitoring/blunting, benefit-finding
 - Effects of distress on HPA and immune function
 - Implications of stress and associated physiological consequences for etiology, recurrence, & survival
 - Psychosocial intervention effects on distress, HPA and immune function, recurrence, survival
- 

Potential Physiological Consequences of Stress

- ↑ BP, HR, catecholamines
- ↑ HPA; release of CRF, ACTH, cortisol
- ↑ Cholesterol, glucose availability, coagulation, fibrinogen
- ↓ immune function, PNS, growth hormone
- ↓ Ability to repair damaged DNA
- Slower wound healing, ↓ resistance to infection






Potential Outcomes:

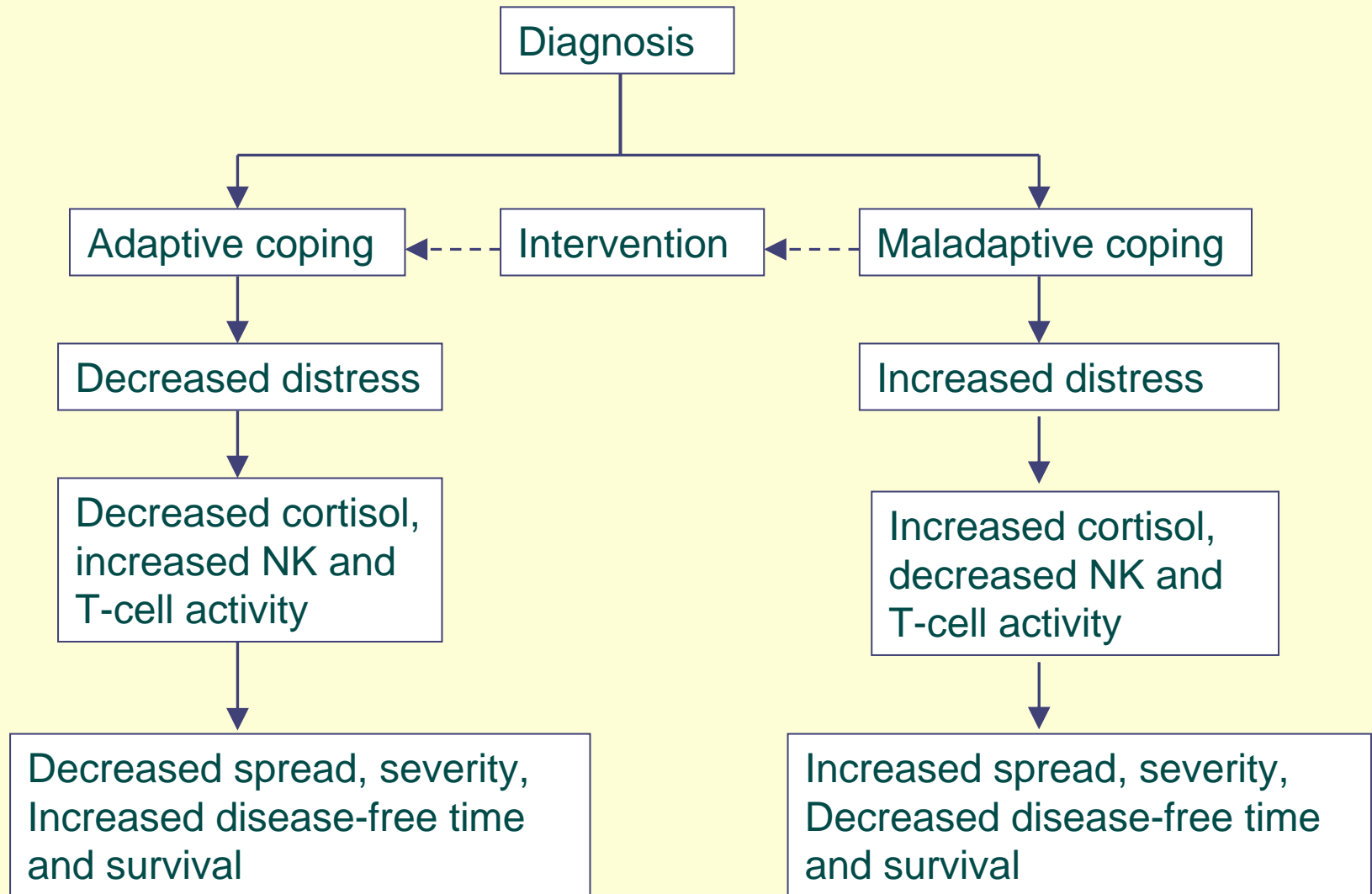
- Poorer psychological health
- Increase in unhealthy behaviors
- Physical health risks

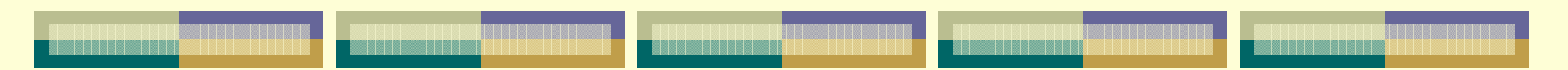
Development of breast cancer?

Progression? Recurrence? Survival?


- Cognitive impairment
 - Higher all-cause mortality
- 

The vision of biopsychosocial research on breast cancer






Physiological consequences of distress in women with breast cancer:

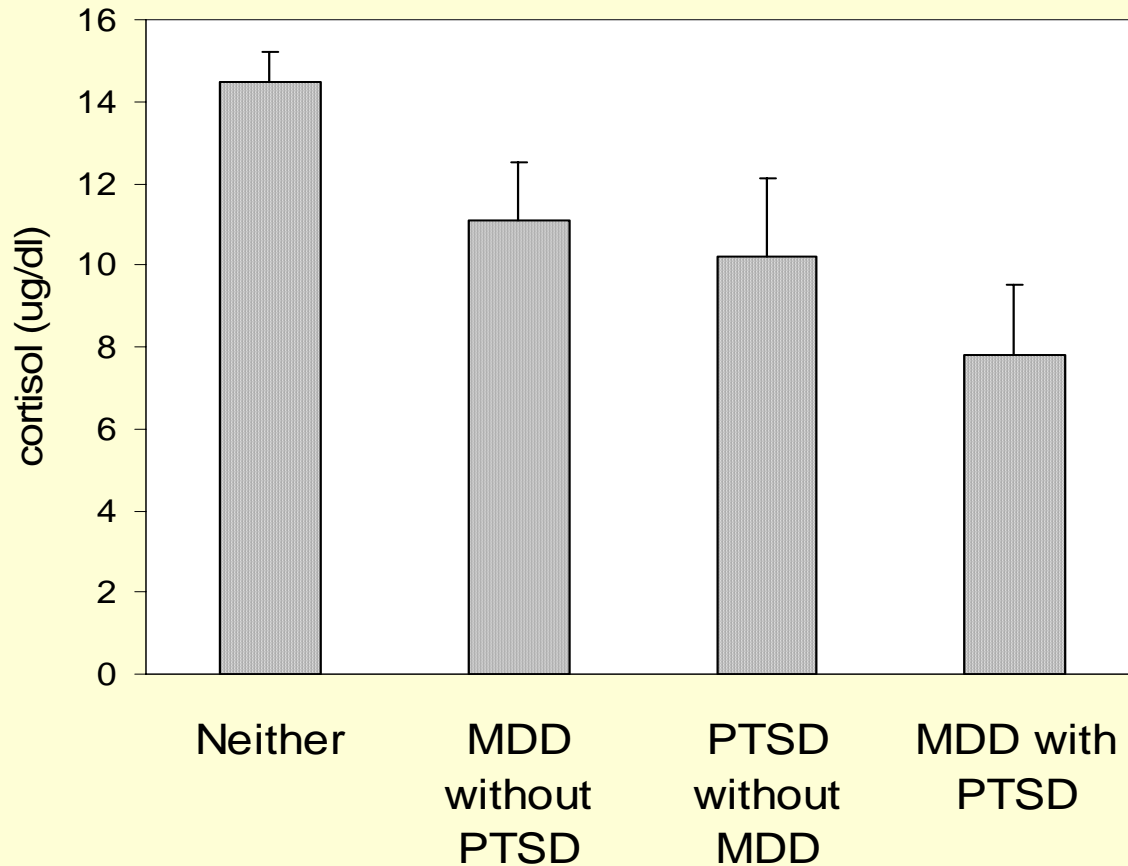
- Increased cortisol or decreased cortisol
 - Decreased NK lysis
 - Lower NK cell numbers
 - Shorter survival time
 - Lower T-cell numbers, decreased proliferative response
 - Flattened cortisol diurnal slope
- 



Cortisol and breast cancer:

- Breast cancer cells have receptors for cortisol
 - Animal models & in vitro: high cortisol levels associated with increased tumor growth
 - Some studies have found elevated cortisol in women with breast cancer
 - Women with metastatic breast cancer have “flat” diurnal slopes of cortisol
 - Flat cortisol slopes associated with shorter survival time
- 

Luecken & Compas, 2004



- Morning plasma cortisol positively correlated with: control beliefs ($R=.42$), positive affect ($R=.34$), and optimism ($R=.26$)
- Morning plasma cortisol negatively correlated with feelings of guilt ($R=-.33$), self-blame ($R=-.28$), and stressful life changes ($R=-.32$).

Abercrombie, Giese-Davis, Sephton, Epel, Turner-Cobb, & Spiegel, 2004

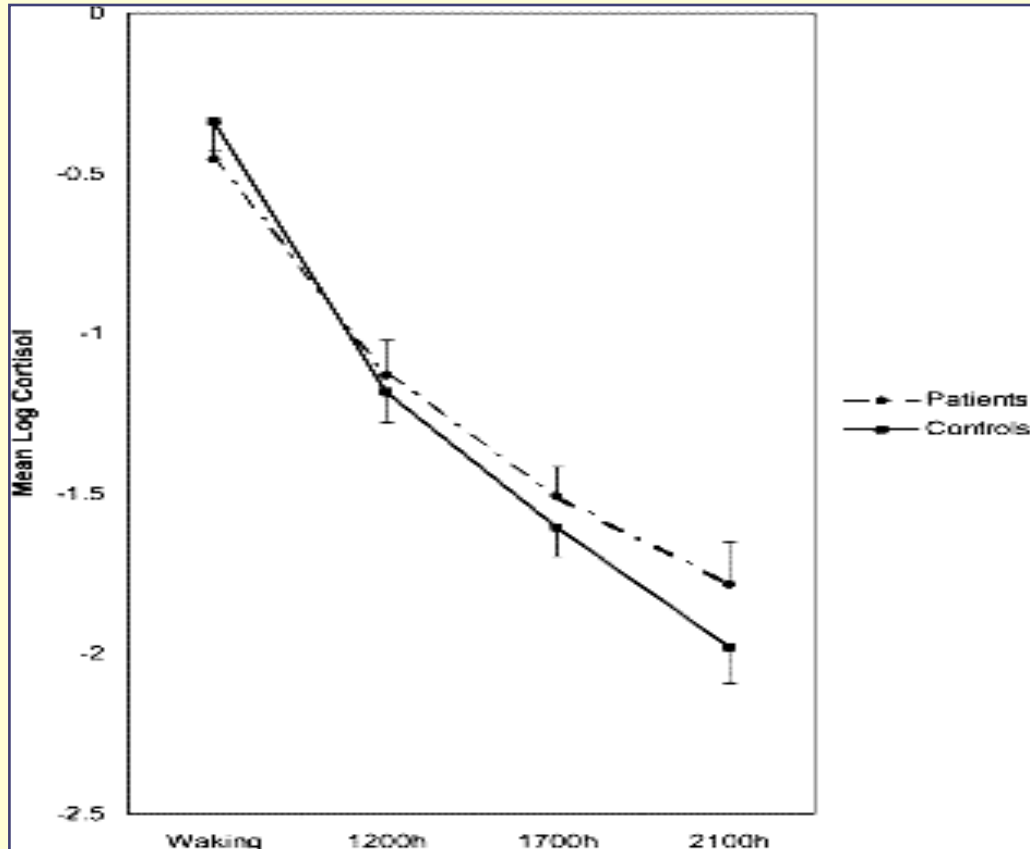


Fig. 1. Mean log cortisol for each time point averaged across 3 days of at-home saliva sampling in patients with metastatic breast cancer compared to controls.


From: Abercrombie, *Psychoneuroendocrinology*, Volume 29, 2004. 1082-1092.



Immune Function and Breast Cancer:

- NK cell activity and T-cell proliferation is decreased in breast cancer
- Lower NK cell and T-cell activity is associated with larger tumors, increased spread of tumor, and positive lymph node status
- NK activity and T-cell proliferative response may be predictive of recurrence and survival – contradictory findings

“In the complex jigsaw of PNI, pieces that fit at the bench-level often do not fit at the bedside” (Garland et al., 2004)





Directions for future research

1. Take a multisystem approach that evaluates complex network of biological systems involved in the stress response, well-being, and cancer progression






Physiological markers of allostatic load

- Cortisol excretion
 - Norepinephrine & epinephrine excretion
 - DHEA-S level
 - Systolic & diastolic blood pressure
 - Waist-hip ratio – abdominal obesity
 - HDL, Total cholesterol/HDL
 - Blood glycosylated hemoglobin
 - C-reactive protein
 - Fibrinogen
-



Directions for future research


1. Take a multisystem approach that evaluates complex network of biological systems involved in the stress response, well-being, and cancer progression
 2. Consider the independent impact of risk and protective factors involved in adjustment to breast cancer
 3. Consider resilient outcomes, predictors of resilience, and interventions to promote resilience
- 



Resilience =

The capacity to bounce back, to regain balance, and sustain interest and motivation for pursuing goals in the face of threats or challenges to health and well-being from internal and external stressors.

Health is the harmonious integration of mind and body within a responsive community



Helgeson, Snyder, & Seltman, 2004

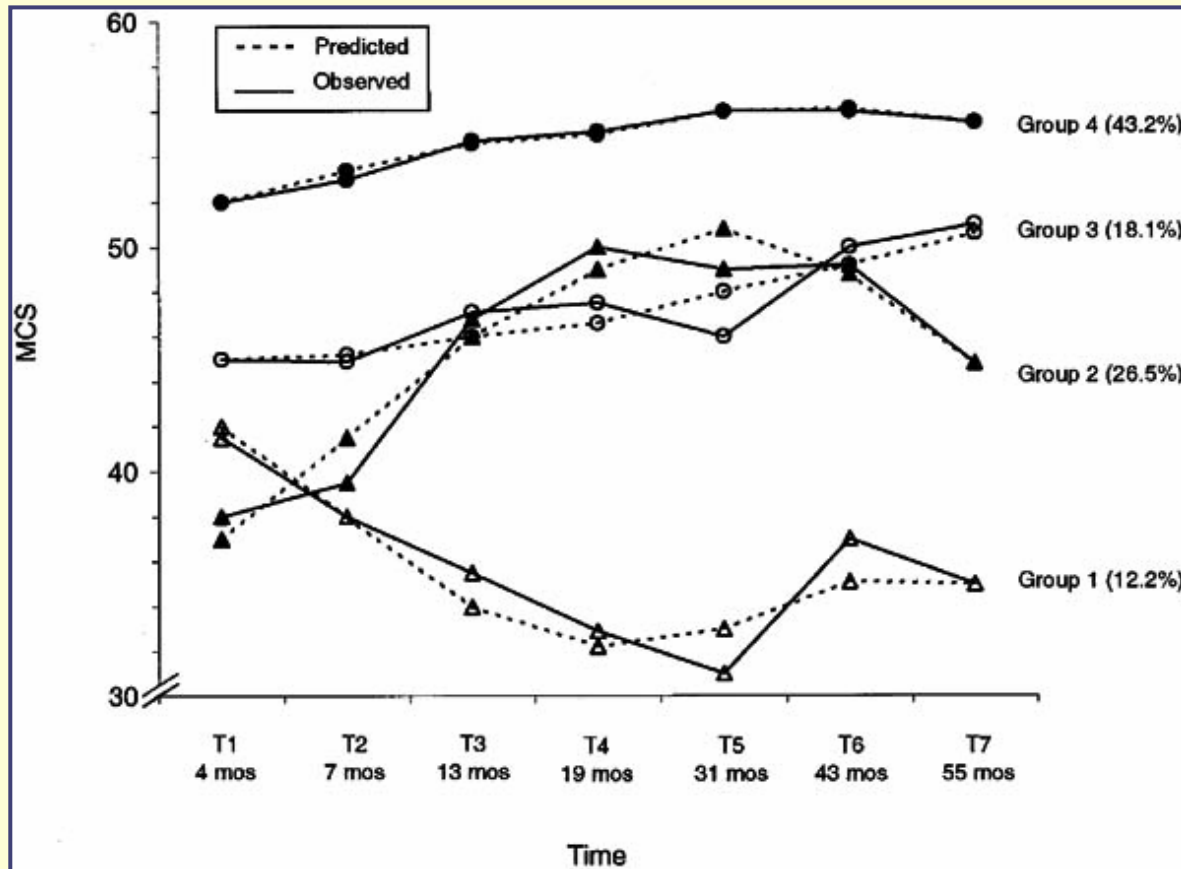
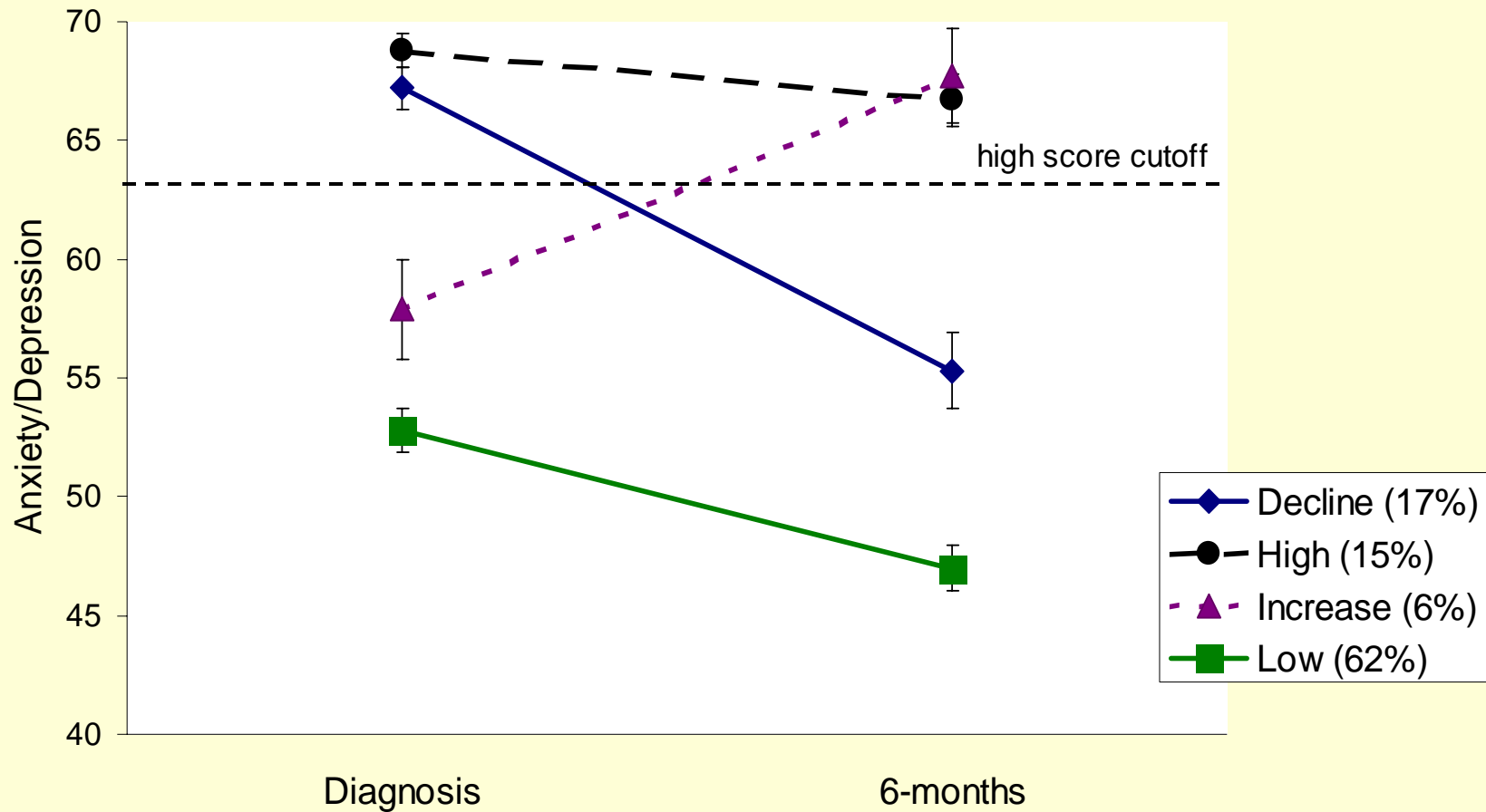


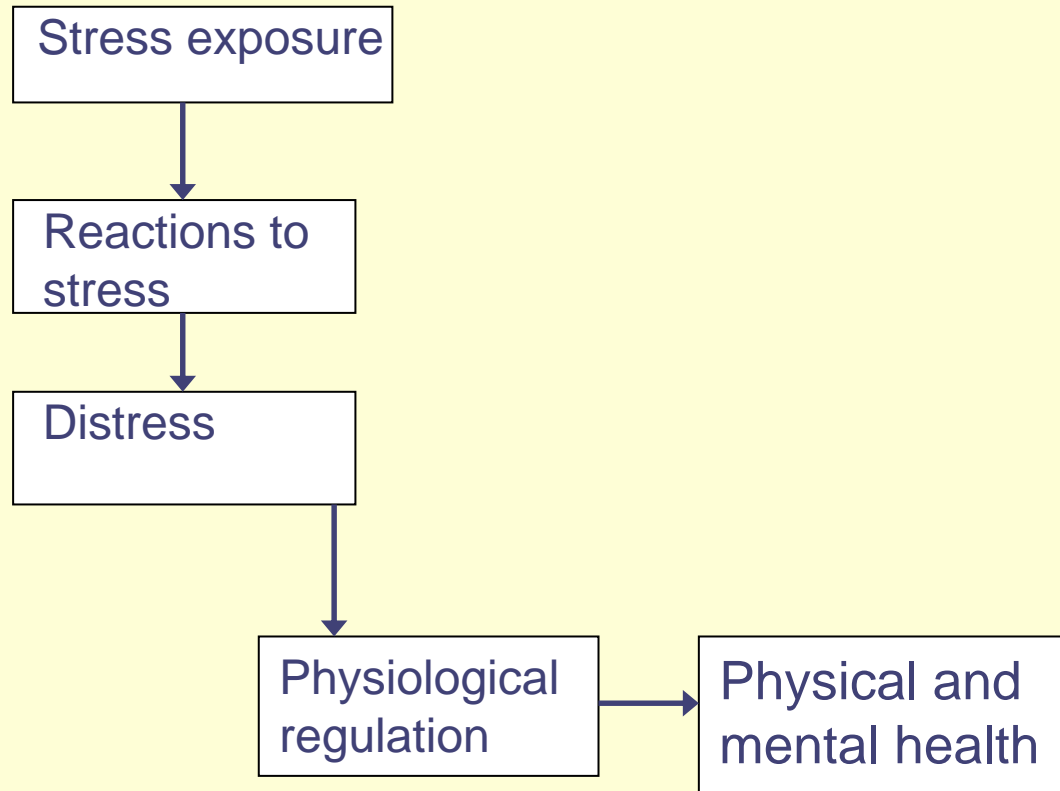
Figure 1. Four trajectories of mental functioning from 4 to 55 months (mos) after breast cancer diagnosis. MCS = Mental Health Component Score; T = time postdiagnosis.

From: Helgeson: Health Psychol, Volume 23(1).January 2004.3-15

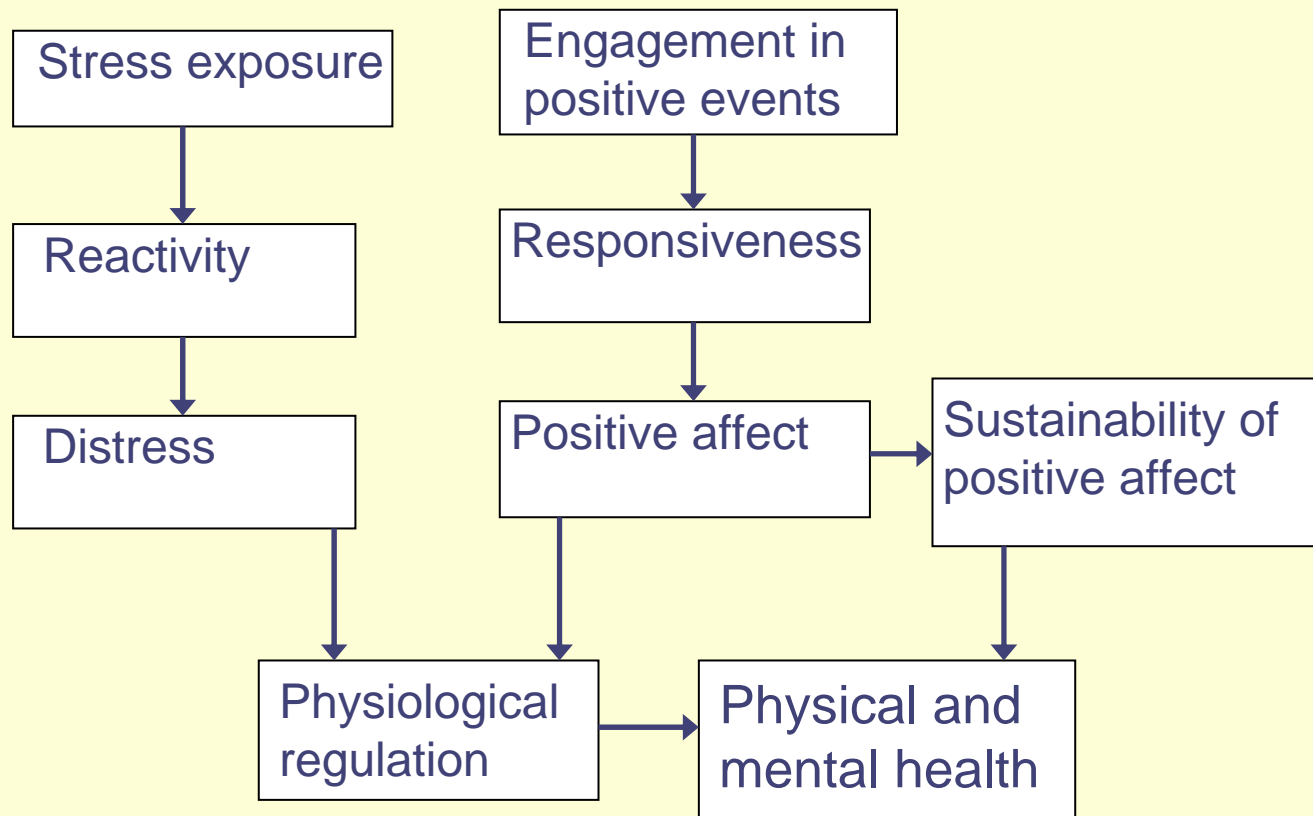
Subgroup patterns of emotional distress over time in newly diagnosed breast cancer patients



One half of the story...



The rest of the story...






Resilience Resources


- Biological level (genetic, regulatory ability)
- Person-level (mastery, coping skills, attachment, cultural identity, social support)
- Community-level (adaptability, connectivity, responsiveness, diversity)

Physiological Markers of Resilience

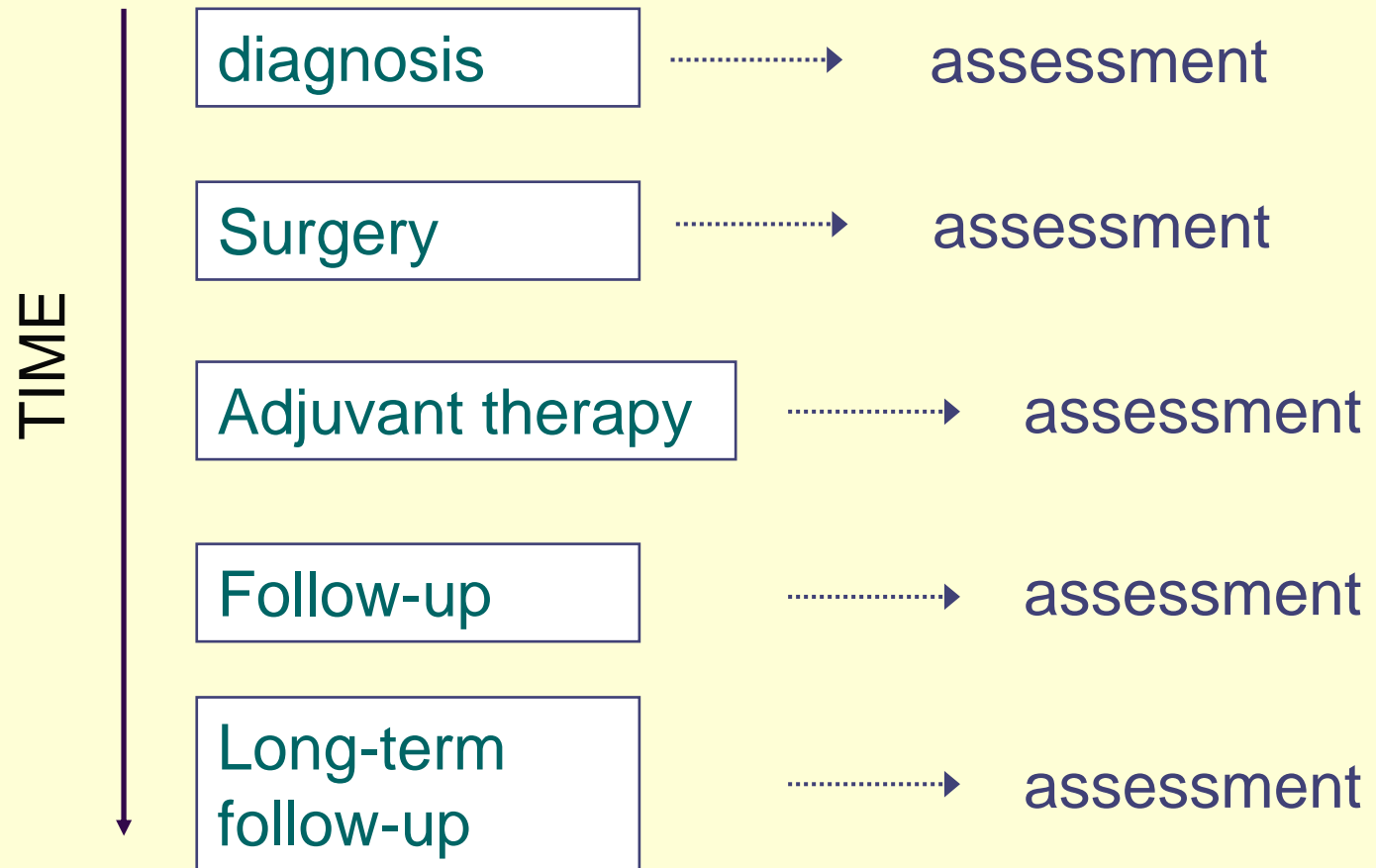
- DHEA
 - Upregulated Neuropeptide-Y
 - Estrogen & prolactin (?)
 - Heart-rate variability
 - Recovery/return to baseline following acute stress
- 



Directions for future research


1. Take a multisystem approach that evaluates complex network of biological systems involved in the stress response, well-being, and cancer progression
 2. Consider the independent impact of risk and protective factors involved in adjustment to breast cancer
 3. Consider resilient outcomes, predictors of resilience, and interventions to promote resilience
 4. Research the daily processes of biopsychosocial adjustment to breast cancer.
- 

Question: What is the lived experience of women with breast cancer?





Daily Diary Studies

- Evaluate how experience of breast cancer plays out in “real life”
 - Validity of retrospective inventories
 - Coping is a dynamic process
 - Repeated measurement of negative and positive events, negative and positive affect, and physiological responses
 - Real-time reactions of physiological measures to events and emotions.
 - How quickly do patients recover positive affect following a stressful medical experience?
- 



Bruce Compas

Richard Hong

The University of Vermont Breast
Care Center

The women who graciously
agreed to participate in our studies

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