Biomarkers and Symptom Management

- Biomarkers offer significant opportunities to understand the biological impact of cancer and its treatment
- Treatment modalities can cause multi-system organ dysfunction and accompanying symptoms
- Organ dysfunction can cause changes in hormone and biochemistries which are vital to regulatory processes
Hypothalmic-Pituitary and Pineal Aging

- Biomarkers of the neuroendocrine system (cortisol, serotonin, melatonin, cytokines)
- Complex interactions (likely different among older adults with cancer compared to young patients)
- Example: While melatonin production may decrease in older adults, a substance called arginine vasotocin (which lessens the inhibition of cortisol), cortisol levels actually increase.
# Biomarkers and Related Symptoms

<table>
<thead>
<tr>
<th>Biomarker</th>
<th>Symptom</th>
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</thead>
<tbody>
<tr>
<td>Cortisol, ACTH</td>
<td>Anxiety, stress</td>
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<tr>
<td>Tryophtan, Serotonin, Melatonin</td>
<td>Fatigue, sleep disturbances, mood</td>
</tr>
<tr>
<td>Cytokines, Inflammatory Neuropeptides</td>
<td>Decreased immunity, sleep disturbances</td>
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Mechanisms of Cancer Related Symptoms

• Changes in biomarker levels and activity may provide a foundation for understanding the mechanisms underlying symptoms
• Interventions can then be tailored to individuals with cancer related symptoms
• Outcomes and evaluation: Biomarker levels may be indicators of outcome measures
Clinical Implications

- Biomarkers have long been used to diagnose and treat disease states
  - PSA (Prostate Cancer)
  - BRAC 1 and 2 (Breast and Ovarian Cancer)
- Limited research exists that supports the use of biomarkers to guide and tailor evidenced-based interventions for patient care
Conclusions

• Clinicians are still selecting interventions based on past practice and chance, assuming what works to reduce fatigue or improve sleep for the 20 y/o patient with Hodgkins lymphoma will likely work for the 75 y/o women with breast cancer

• We cannot assume that age does not matter