

## Melatonin and Breast Cancer: A Prospective Study

Travis RC, Allen DS, Fentiman IS, et al

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Numerous hypotheses have been entertained to explain increases in the incidence of breast cancer; this article debunks another one—that breast cancer develops because of decreases in the endogenous pineal hormone melatonin. Circumstantial evidence in favor of the hypothesis has included reports of increased breast cancer in flight attendants, night shift workers, and the visually impaired, linking altered sleep cycles with breast cancer. Melatonin is normally produced during sleep and is believed to be involved in repair of cellular processes; both natural and artificial light suppress melatonin production. For the hypothesis presented here to be proven, women who develop breast cancer should have had lower melatonin levels before the breast cancer than women who do not develop breast cancer. This article reports the first case-controlled prospective study in which a melatonin metabolite was measured in 24-hour urine samples collected more than 20 years ago from more than 5,000 women. The women were followed for development of breast cancer, and the melatonin metabolite was measured and analyzed from new cases and nested matched controls. No statistical relationship was found between breast cancer and endogenous melatonin production. Hence although loss of sleep may be deleterious to health and even may relate through other mechanisms yet to be discovered to the development of breast cancer, melatonin levels measured at a single time point in this group of women had no predictive value for the development of breast cancer. Curiously, information on the occupation and sleep habits of the women in the study was not included in the analysis.

Melatonin has been touted as a potent antioxidant as well as a sleep aid. Ingested orally, melatonin has little known toxicity, and it is also likely to represent only 1 component of a larger set of sleep-induced or sleep-inducing hormones. The mechanisms of sleep remain unresolved at this time. However, the significance of sleep for health remains clear—in fact, it is widely believed that humans cannot survive if they are deprived of sleep. The relationship of sleep quality and quantity to breast cancer remains an intriguing area of investigation. However, the hypothesis that low melatonin levels may lead to breast cancer was largely disproven by the findings in this report.

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## Benefits and Costs of Interventions to Improve Breast Cancer Outcomes in African American Women

Mandelblatt JS, Schechter CB, Yabroff KR, et al

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Mandelblatt and colleagues used stochastic simulation modeling to evaluate the incremental societal costs and benefits of the current status quo vs targeted biennial screening or treatment improvements

among African American women aged 40 years or more. They concluded that except for subsets of unscreened women or women at particularly high risk of breast cancer, further interventions to increase screening are unlikely to be an efficient use of resources. They further concluded that intensive treatment of African American women diagnosed with breast cancer is the more cost-effective approach to reducing the disproportionately high mortality seen in African American women.

Although the stochastic simulation model used by the authors is interesting, a model cannot adequately simulate findings seen in the clinic. Clinical practice is constantly evolving and is dynamically shaped by diverse medical, logistic, and social forces.<sup>1</sup> It is also difficult to apply a model to dissimilar populations. Breast cancer incidence is lower among African American women than among white women, yet mortality rates are higher.<sup>2</sup> African American women are more likely to have estrogen-receptor negative tumors and to present with more advanced disease.<sup>2,3</sup> The age-incidence curves for African American and white women are also different; for women younger than 45, the incidence of breast cancer is higher in African American women than in white women.<sup>4</sup>

The true test of outcome involves quality of life as well as survival after breast cancer diagnosis. The disparity in breast cancer outcomes for African American women vs those for white women is the product of many factors. Identifying and addressing the causes of the disparity will lead to the elimination of the disparity. At this time, further analysis is necessary to determine the most cost-effective way or ways to improve breast cancer outcomes in African American women.

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## References

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