

# Weight management & physical activity and breast cancer: knowing the facts and removing the stigma

## Abstract

Breast cancer is the leading cancer diagnosis among women in the United States and accounts for 40,000 deaths annually. Risk factors for breast cancer include female sex, age, and family history. There are modifiable risk factors as well, such as alcohol use, obesity, lack of physical activity, and exposure to exogenous estrogen. Obesity and physical inactivity not only increase the risk of developing breast cancer, but confer a poor prognosis for women with these conditions at the time of a breast cancer diagnosis. It is imperative to improve the communication between physicians and overweight and inactive patients in regards to these two conditions to not only reduce their risk of developing breast cancer but also to avoid the poor prognosis associated with such individuals who are diagnosed with the disease.

**Keywords:** physical activity, obesity, breast cancer, cancer risk, prognosis

Volume 4 Issue 3 - 2016

Lindsay L Peterson, Mathew J Gregoski

Department of Medicine, Medical University of South Carolina, USA

**Correspondence:** Mathew J Gregoski, Department of Nursing, Medical University of South Carolina, College of Nursing, 99 Jonathan Lucas St., MSC 160, Charleston, SC 29425-1600, USA, Tel (843)7929558, Fax (843)7921741, Email gregoski@musc.edu

**Received:** October 27, 2015 | **Published:** February 25, 2016

## Introduction

Breast cancer (BC) is the 2nd leading cause of cancer death in women in the United States (US). There are over 40,000 deaths from BC and 16 billion dollars spent on BC related medical care in the US every year.<sup>1</sup> Mammograms are screening tests designed to find BC in earlier stages so it can be treated before it becomes more aggressive requiring more intense treatment. Risk factors for breast cancer include female sex,<sup>2</sup> increasing age,<sup>3</sup> obesity (in postmenopausal women, which is the most common group diagnosed with breast cancer),<sup>4,5</sup> prolonged exposure to estrogen,<sup>6-9</sup> alcohol use<sup>10,11</sup> and a family history of BC (Table 1).<sup>12,13</sup>

**Table 1** Risk factors for breast cancer

Risk factors for breast cancer	Modifiable risk factors for breast cancer
Female Sex	Obesity
Older Age	Physical Inactivity
Endogenous Estrogen Exposure	Exogenous Estrogen Exposure
Family History of Breast Cancer	Alcohol
White Race	Smoking

Some of these risk factors, such as sex, age and family history, are beyond our control. Other risk factors such as weight and alcohol use are modifiable risk factors, indicating that a change in lifestyle can lead to a reduced risk of BC. In addition to obesity being a risk factor for the development of postmenopausal BC, there is evidence that for some women a lack of physical activity increases the risk for BC<sup>14</sup> and that regular physical activity decreases BC risk.<sup>15</sup> Perhaps more striking, both increased weight and a lack of regular physical activity at the time of a breast cancer diagnosis are associated with a worse prognosis for women diagnosed with BC.<sup>16-18</sup> Weight is classified into normal, overweight and obese categories by calculated a person's body mass index (BMI) using height and weight (Table 2). BMI calculators are available on-line and on smartphone applications. Individuals with a BMI between over 25 are considered overweight.

**Table 2** BMI (Weight in Pounds / (Height in inches x Height in inches)) x 703

Underweight	Normal	Overweight	Obese
<18.5	18.4-24.9	25.1-29.9	>30

Physicians need to discuss weight and activity levels with their patients. Patients need to know that they have the power to both reduce their risk of a breast cancer diagnosis, and improve their prognosis should they be one of the 1 in 8 women that will be diagnosed with BC in their lifetime. There is a stigma associated with obesity that makes discussion regarding weight loss and increasing physical activity difficult for doctors and patients to engage in. Physicians, however, would not ignore a high blood pressure or elevated sugar level in a diabetic patient. They would discuss the risk that these conditions pose to their patients, and advise them on the best way to improve these conditions in order to optimize their overall health. Weight and physical activity need to be addressed in the same manner and physicians and patients need to give them the same considerations they would other conditions that threaten healthy living.

## Obesity increases the risk for BC, physical activity decreases the risk

Several studies have shown that being overweight or obese increases the risk of developing BC,<sup>4,5,16</sup> especially hormone positive BC, which is the most common form of BC. The Women's Health Initiative Trial indicates that obese women have a 52% increased risk of developing hormone positive BC compared to normal weight individuals (BMI<25) and that women with Grade 2 obesity (BMI>35) had an 86% increased risk of hormone positive BC.<sup>19</sup> Other studies show similar if not more striking increases in risk. There have also been over 60 studies evaluating physical activity and BC risk. The majority of these studies consistently show that physically active women are on average 25% less likely to develop BC than sedentary women<sup>20</sup> and that a greater amount of activity leads to a greater reduction in risk of BC.<sup>21</sup> The amount of activity that defines "physically active" is generally 3-4hours per week of "moderate intensity" activity. Examples of moderate intensity activity are brisk walking, light bicycling, mowing the lawn and playing doubles tennis.

## Mechanistic associations between obesity and lack of physical activity and breast cancer

The mechanisms affecting BC risk and outcomes such as risk of recurrence and death are complex and multifactorial. Overweight/obesity and physical inactivity may increase the risk of breast cancer through changes in immune function as well as changes in hormones, insulin and glucose levels, and fat storage of carcinogens.<sup>22</sup> Obesity increases insulin, glucose, free fatty acids, and estrogen, all of which increase cytokines and inflammatory markers, which increase the risk of BC.<sup>23</sup> Studies have shown that weight loss and exercise can reduce many of these factors, such as insulin, glucose and inflammatory markers.<sup>24</sup> Additionally, in a patient with a diagnosis of BC, these factors have effects on the tumor that can promote tumor growth and metastatic potential by affecting various cell signaling pathways.<sup>25–27</sup>

### Obesity and decreased physical activity are associated with a poor prognosis in patients diagnosed with BC

Between 15 and 35% of patients diagnosed with BC are obese at the time of diagnosis. Given the rise of obesity in the general US population in the last 40 years from 15 to 35%, these numbers are not surprising as they mirror those of non-cancer patients. Looking at over 40 studies, obesity at the time of a BC diagnosis increases the risk of death from breast cancer by 33%.<sup>16</sup> The majority of patients, up to 70%, report either no regular physical activity or less than 3 hours of weekly activity at the time of BC diagnosis and overweight and obese patients are less likely to be engaging in the recommended amount of physical activity than normal weight individuals at the time of BC diagnosis.<sup>28</sup> Over 25 studies have shown that those who are physically active at the time of diagnosis have an improved survival over non-physically active patients by nearly 30%.<sup>29</sup> The American Cancer Society publication *Nutrition and Physical Activity Guidelines for Cancer Survivors* states that “for a woman diagnosed with breast cancer, achieving or maintaining a desirable weight may be one of the most important lifestyle pursuits”. Given the evidence and such a strong statement from the American Cancer Society, why aren’t more patients receiving counseling on the role of diet and exercise in regards to cancer prevention and prognosis?

### Improving doctor-patient communications on weight management and physical activity

Surveys have shown that although most doctors report counseling their patients on their weight, most patients report that they have never received such counseling. There are likely several reasons why such communications are either not ideal or not occurring at all. Physicians strive for patient satisfaction. When patients are told by their physician that they need to lose weight, or engage in more physical activity, they may feel offended. This can lead to patient dissatisfaction. Additionally, such recommendations may be met with resistance or lack of motivation from the patient.<sup>30</sup> Some physicians feel uncomfortable having such conversations without formal training and thus may not feel qualified to offer such advice.<sup>31,32</sup> Other physicians may struggle with weight management themselves, which can make them less likely to counsel their patients on healthy lifestyle.<sup>33</sup> Lack of time and inadequate reimbursement are additional barriers.<sup>32</sup>

However, when a patient walks in a room with an obvious limp, a physician will inquire as to what symptoms they are experiencing, what occurred prior to the development of the limp, and then make clinical decisions regarding any further needed work up or treatment,

even if the patient is in the office for an unrelated condition. That same patient, who walks in and is by chart review or visual assessment clearly overweight or obese, should be asked about their diet and activity patterns, barriers to improving those lifestyle behaviors, and given advice on how to better manage their weight. At a minimum, the American Cancer Society guidelines regarding diet and activity for cancer prevention should be discussed. These include limiting high calorie foods and beverages and increasing physical activity to promote weight loss. More specifically, patients should be advised to follow a diet that is high in vegetables, fruits and whole grains. Activity should consist of at least 150 minutes of moderate intensity activity per week, including 2 or 3 sessions of strength training.<sup>34</sup>

A prescription can be given for high blood pressure or a sinus infection and physicians don’t hesitate to give such prescriptions. Why not give a prescription with diet and activity recommendations? It conveys that these are important issues, and gives clear directions on what is recommended.<sup>35</sup> Further follow up can then be arranged with a nutritionist, dietician, or physical activity program if needed. Importantly, just as follow up is arranged to check the status of high blood pressure and diabetes, follow up should be arranged to check on the status of weight and activity.

Weight management and meeting physical activity guidelines can be challenging, for both physicians and patients alike. However, without appropriate acknowledgement, assessment and plans from physicians, patients are unlikely to make changes on their own. It’s time for physicians and patients to stop overlooking the problem of obesity and physical inactivity and get on board with a healthy lifestyle.

## Acknowledgements

None.

## Conflict of interest

The author declares no conflict of interest.

## References

- Mariotto AB, Yabroff KR, Shao Y, et al. Projections of the cost of cancer care in the United States: 2010–2020. *J Natl Cancer Inst.* 2011;103(2):117–128.
- Jemal A, Bray F, Center MM, et al. Global cancer statistics. *CA Cancer J Clin.* 2011;61(2):69–90.
- Siegel R, Naishadham D, Jemal A. Cancer statistics, 2012. *CA Cancer J Clin.* 2012;62(1):10–29.
- Eliassen AH, Colditz GA, Rosner B, et al. Adult weight change and risk of postmenopausal breast cancer. *JAMA.* 2006;296(2):193–201.
- Emaus MJ, van Gils CH, Bakker MF, et al. Weight change in middle adulthood and breast cancer risk in the EPIC–PANACEA study. *Int J Cancer.* 2014;135(12):2887–2899.
- Hsieh CC, Trichopoulos D, Katsouyanni K, et al. Age at menarche, age at menopause, height and obesity as risk factors for breast cancer: associations and interactions in an international case–control study. *Int J Cancer.* 1990;46(5):796–800.
- Breast cancer and hormone replacement therapy: collaborative reanalysis of data from 51 epidemiological studies of 52,705 women with breast cancer and 108,411 women without breast cancer. Collaborative Group on Hormonal Factors in Breast Cancer. *Lancet.* 1997;350(9084):1047–1059.

8. Key T, Appleby P, Barnes I, et al. Endogenous sex hormones and breast cancer in postmenopausal women: reanalysis of nine prospective studies. *J Natl Cancer Inst.* 2002;94(8):606–616.
9. Farhat GN, Cummings SR, Chlebowski RT, et al. Sex hormone levels and risks of estrogen receptor–negative and estrogen receptor–positive breast cancers. *J Natl Cancer Inst.* 2011;103(7):562–570.
10. Chen WY, Rosner B, Hankinson SE, et al. Moderate alcohol consumption during adult life, drinking patterns, and breast cancer risk. *JAMA.* 2011;306(17):1884–1890.
11. Liu Y, Colditz GA, Rosner B, et al. Alcohol intake between menarche and first pregnancy: a prospective study of breast cancer risk. *J Natl Cancer Inst.* 2013;105(20):1571–1578.
12. Familial breast cancer: collaborative reanalysis of individual data from 52 epidemiological studies including 58,209 women with breast cancer and 101,986 women without the disease. *Lancet.* 2001;358(9291):1389–1399.
13. Ruszczyk M, Zirpoli G, Kumar S, et al. Breast cancer risk factor associations differ for pure versus invasive carcinoma with an in situ component in case–control and case–case analyses. *Cancer Causes Control.* 2016;27(2):183–198.
14. McTiernan A, Kooperberg C, White E, et al. Recreational physical activity and the risk of breast cancer in postmenopausal women: the Women’s Health Initiative Cohort Study. *JAMA.* 2003;290(10):1331–1336.
15. Liu L, Shi Y, Li T, et al. Leisure time physical activity and cancer risk: evaluation of the WHO’s recommendation based on 126 high–quality epidemiological studies. *Br J Sports Med.* 2016;50(6):372–378.
16. Protani M, Coory M, Martin JH. Effect of obesity on survival of women with breast cancer: systematic review and meta–analysis. *Breast Cancer Res Treat.* 2010;123(3):627–635.
17. Irwin ML, Smith AW, McTiernan A, et al. Influence of pre– and postdiagnosis physical activity on mortality in breast cancer survivors: the health, eating, activity, and lifestyle study. *J Clin Oncol.* 2008;26(24):3958–3964.
18. Nechuta S, Chen WY, Cai H, et al. A pooled analysis of post–diagnosis lifestyle factors in association with late estrogen–receptor positive breast cancer prognosis. *Int J Cancer.* 2016;138(9):2088–2097.
19. Neuhauser ML, Aragaki AK, Prentice RL, et al. Overweight, Obesity, and Postmenopausal Invasive Breast Cancer Risk: A Secondary Analysis of the Women’s Health Initiative Randomized Clinical Trials. *JAMA Oncol.* 2015;1(5):611–621.
20. Lynch BM, Neilson HK, Friedenreich CM. Physical activity and breast cancer prevention. *Recent Results Cancer Res.* 2011;186:13–42.
21. Wu Y, Zhang D, Kang S. Physical activity and risk of breast cancer: a meta–analysis of prospective studies. *Breast Cancer Res Treat.* 2013;137(3):869–882.
22. McTiernan A, Ulrich C, Slate S, et al. Physical activity and cancer etiology: associations and mechanisms. *Cancer Causes Control.* 1998;9(5):487–509.
23. Goodwin PJ, Stambolic V. Impact of the obesity epidemic on cancer. *Annu Rev Med.* 2015;66:281–296.
24. Mason C, Foster–Schubert KE, Imayama I, et al. Dietary weight loss and exercise effects on insulin resistance in postmenopausal women. *Am J Prev Med.* 2011;41(4):366–375.
25. Khandekar MJ, Cohen P, Spiegelman BM. Molecular mechanisms of cancer development in obesity. *Nat Rev Cancer.* 2011;11(12):886–895.
26. Braun S, Bitton–Worms K, LeRoith D. The link between the metabolic syndrome and cancer. *Int J Biol Sci.* 2011;7(7):1003–1015.
27. Gilbert CA, Slingerland JM. Cytokines, obesity, and cancer: new insights on mechanisms linking obesity to cancer risk and progression. *Annu Rev Med.* 2013;64:45–57.
28. Irwin ML, McTiernan A, Bernstein L, et al. Physical activity levels among breast cancer survivors. *Med Sci Sports Exerc.* 2004;36(9):1484–1491.
29. Ibrahim EM, Al–Homaidh A. Physical activity and survival after breast cancer diagnosis: meta–analysis of published studies. *Med Oncol.* 2011;28(3):753–765.
30. Mercer SW, Tessier S. A qualitative study of general practitioners’ and practice nurses’ attitudes to obesity management in primary care. *Health Bull.* 2001;59(4):248–253.
31. Vetter ML, Herring SJ, Sood M, et al. What do resident physicians know about nutrition? An evaluation of attitudes, self–perceived proficiency and knowledge. *J Am Coll Nutr.* 2008;27(2):287–298.
32. Kushner RF. Barriers to providing nutrition counseling by physicians: a survey of primary care practitioners. *Prev Med.* 1995;24(6):546–552.
33. Reilly JM. Are obese physicians effective at providing healthy lifestyle counseling? *Am Fam Physician.* 2007;75(5):738–741.
34. Kushi LH, Doyle C, McCullough M, et al. American Cancer Society Guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. *CA Cancer J Clin.* 2012;62(1):30–67.
35. Phillips EM, Kennedy MA. The exercise prescription: a tool to improve physical activity. *PM R.* 2012;4(11):818–825.