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Nutrition, Metabolism, and Integrative Approaches in Cancer Survivors

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Objectives: *To review emerging issues about metabolic changes occurring in cancer survivors during and as a result of therapy, the role of nutrition, weight control, stress management, nutritional supplements, and other complementary diet therapies, methods of mitigating side effects of treatment affecting dietary intake, and to suggest future research directions.*

Data Sources: *Literature review and professional clinical experience with oncology patients.*

Conclusion: *Enhancing cancer survivorship requires knowledge and application of nutritional science and integrative health care approaches.*

Implications for Nursing Practice: *Reliable, personalized, team-generated nutritional advice must be provided to cancer patients and cancer survivors to reduce risk of recurrence, optimize energy balance, and improve quality of life.*

Key Words: *Nutrition, energy balance, dietary supplements, mind-body therapies, integrative oncology, complementary cancer therapies*

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THE role of nutrition in cancer has always been controversial. Do certain foods prevent cancer, cause it, or help prevent recurrence? Of course, unexplained weight loss always raises the specter of cancer or recurrence. What is less recognized is that obesity, both before and as a result of cancer treatment, is a significant risk for cancer and its recurrence. In this context, metabolic changes affecting the way the body handles insulin, energy, and fat metabolism are emerging concerns for cancer patients. Therapeutic challenges include fatigue, anorexia, dysgeusia, mucositis, and other afflictions limiting nutritional intake.

The clinical team may struggle to develop dietary and exercise strategies for cancer patients and survivors to optimize their caloric intake and absorption to maintain weight, or in some cases to reduce it. Stress raises cortisol levels, affects our dietary habits, changes our hormonal milieu, and reduces immunity. Managing stress through mind-body practices is another interdisciplinary intervention to manage the risk profile in cancer care. Complementary therapies and nutritional supplements offer additional layers of patient-centered interventions that embrace the potent impact of nutrition and diet in cancer therapy and survivorship.

In this review, we synopsize the key issues related to these topics, linking them to evidence-based practices and future research directions. This will support nurses and other clinicians as they offer counsel to cancer patients and survivors related to optimizing their nutritional status, long-term survival, and overall well-being.

Americans are more likely to survive after a cancer diagnosis today than ever before. About 14.5 million Americans are alive after being told they have cancer; two out of three of these will be alive for 5 years or longer after cancer diagnosis. It is estimated that 1,665,540 US citizens will be diagnosed with cancer in 2014 and, because many of these diagnoses occur in those who are 65 and older, there will be a rapid increase in the number of new cases diagnosed due to a large proportion of an aging population.[1]

Cancer arises when control of cell death is lost. Some cancers are caused by inherited genetic mutations, but only a small percentage of these are responsible for new or recurrent cancer. In the majority of cases, interaction between cancer cells and their environment is responsible for cancer progression. Most of these factors that change tumor microenvironment are related to lifestyle. A significant number of cancers are preventable; the greatest example being cancers related to tobacco use. Other factors that have been associated with higher incidence of cancer are lack of physical activity, obesity, non-participation in prevention programs, and over-exposure to ultraviolet light.

Cancer survivors are at greater risk for developing other diseases and secondary cancers. It has been documented that cancer patients die at a higher rate than people in the general population from non-cancer causes. Those with a consistent primary care provider who tends to these non-cancer problems experience longer and better quality of life in general. The decrease in functional status and increase in disability that result from cancer and its treatment are of significant concern. Cancer survivors have an almost two-fold increase in having at least one functional limitation.[2,3]

The presence of comorbidities, in addition to cancer history, is associated with impaired functional status. The presence of another comorbid condition increases the chance of dying from non-cancer-related causes.

Energy Balance, Metabolism, Insulin Resistance in Cancer

In the Western world, there has been a marked increase in obesity during the past several decades. Obesity has been associated with higher risk in developing cancer of the esophagus, breast (especially post-menopausal), endometrium, colon and rectum, kidneys, pancreas, thyroid, gall bladder, and possibly other cancers. Obesity and weight gain have been established as negative prognostic risk factors in cancer patients because body fat is an important source of growth hormones. The relationship between obesity and incidence of cancer is a consistent association found in multiple epidemiologic studies. The fact that cancer incidence is lower after bariatric surgery further supports this association.

Because many cancer survivors, especially those with breast, endometrial, and colon cancers, are at increased risk for weight gain, decreasing body fat is becoming a priority in this population. Obesity, inactivity, and poor dietary quality are

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