

In Reply

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Disclosures of potential conflicts of interest may be found at the end of this article.

We appreciate Dr. Klement's insightful comments. The authors agree that a ketogenic diet (KD) can be added as a type of dietary intervention in cancer treatment. We believe the umbrella term "nutrient restriction" should be used to describe all types of dietary modification, including caloric restriction (CR), intermittent fasting (IF), and a KD [1]. Whereas various types of nutrient restriction may alter key molecular pathways in the same manner, they may alter others differently. It also may be determined that, clinically, certain cancer types benefit most from a specific type of dietary intervention. For example, as Dr. Klement states, it may be found that patients with cancers that are prone to cachexia, such as pancreatic cancer, may benefit most from a KD, whereas patients with cancers known to do worse with weight gain, such as breast cancer, may benefit most from CR or IF [2]. This should be evaluated thoroughly for each cancer and subtype.

A KD should be evaluated thoroughly. We pointed out the potential benefit of carbohydrate restriction in our report, as some of the historical CR studies noted the largest benefit solely with carbohydrate reduction [3]. It is unknown whether this was accomplished by reducing circu-

lating glucose or from downregulation of the insulin growth factor pathway through a reduction in circulating insulin, although both may be reasonable assumptions. Recent data from a pilot trial in patients with cancer receiving a ketogenic diet revealed such effects on the insulin pathway [4].

We also agree that micronutrients are vital and their content must be addressed when discussing and evaluating nutrient restriction. Dietary interventions are often thought of as reductions of macronutrients, more specifically carbohydrates, fats, or protein; however, caloric restriction is often a restriction of overall calories and may overlook micronutrient content, which can be significantly altered with various dietary interventions.

Finally, the authors agree that with any dietary intervention during cancer treatment, a multidisciplinary approach is vital, with both dietary counseling from a trained professional and counseling in behavioral modification to ensure adherence to the intervention.

DISCLOSURES

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