### Title
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### Journal
Journal of Renal Nutrition, 24(6)

### ISSN
1051-2276



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### Publication Date
2014-11-01

### DOI
10.1053/j.jrn.2014.08.003

# To Eat or Not to Eat—International Experiences With Eating During Hemodialysis Treatment

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Providing food or nutrition supplements during hemodialysis (HD) may be associated with improved nutritional status and reduced mortality; however, despite these potential benefits, eating practices vary across countries, regions, and clinics. Understanding present clinic practices and clinician experiences with eating during HD may help outline best practices in this controversial area. Therefore, the objective of this study was to examine clinical practices and experiences related to eating during HD treatment. We surveyed clinicians about their clinic practices during the 2014 International Society of Renal Nutrition and Metabolism Conference. We received 73 responses from six continents. Respondents were primarily dietitians (71%) working at units housed in a hospital (63%). Sixty-one clinics (85%) allowed patients to eat during treatment, with 47 of these patients (65%) actively encouraging eating. Fifty-three clinics (73%) provided food during HD. None of the nine clinics from North America, however, provided food during treatment. The majority (47 clinics; 64%) provided supplements during treatment. Clinics in the hospital setting were more likely to provide food during treatment, whereas outpatient clinics were less likely to provide nutrition supplements ($P \leq 0.05$ for both). We also asked clinicians about their experience with six commonly cited reasons to restrict eating during treatment using a four-point scale. Clinicians responded they observed the following conditions "rarely" or "never": choking (98%), reduced Kt/V (98%), infection control issues (96%), spills or pests (83%), gastrointestinal issues (71%), and hypotension (62%). Our results indicate that while eating is common during treatment in some areas, disparities may exist in global practices, and most of the proposed negative sequelae of eating during HD are not frequently observed in clinical practice. Whether these disparities in practice can explain global differences in albumin warrants further research to help inform decisions regarding eating during HD.



## Introduction

MAINTENANCE HEMODIALYSIS (HD) is a highly catabolic condition. Poor nutritional status is common in HD patients[1] and is associated with reduced quality of life,[2] increased hospitalizations,[3] and increased mortality.[4] Providing patients with supplemental nutrition during a single HD treatment increases skeletal muscle protein synthesis, reduces catabolism, and improves net protein balance.[5-7] Long-term provision of nutrition during HD treatment has been shown to increase nutritional indicators such as albumin,[8] lean mass,[9] and subjective global assessment[10] as well as quality of life.[11] These improvements in nutritional status may contribute to the recent observation that intradialytic oral nutrition supplementation programs are associated with significant reductions in mortality.[12,13]

Despite these benefits, many clinics do not allow patients to eat during HD treatment. Many reasons have been proposed to restrict patients from eating during HD, including hemodynamic instability, choking risk, and reductions in dialysis efficiency, among others[14-16]; however, these concerns are primarily anecdotal as there is little evidence in the published literature supporting them. The lack of research on this topic may contribute to varying clinical practices.[17] Furthermore, differences in clinic practices on eating during treatment have been suggested to contribute to the global disparities in albumin and other nutrition indicators.[14,18] Describing international clinic practices is an important step to better understand worldwide differences in nutritional outcomes and determine best practices. Therefore, we set out to perform a survey to describe international practices on eating during treatment and to provide insight into clinical experiences with eating during treatment.

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*Support: B.K. is currently funded by an American Heart Association Predoctoral Fellowship. D.B. is currently employed by DaVita Healthcare Partners, Denver, Colorado. M.B. is currently employed by DaVita Healthcare Partners, Denver, Colorado. M.S. is currently employed by DaVita Healthcare Partners, Denver, Colorado. K.K.-Z. is funded by National Institutes of Health grant R21-DK078012 and philanthropic grants from Mr. Harold Simmons and Mr. Louis Chang for this manuscript. K.R.W. is currently funded by the National Institutes of Health grant R01-DK084016.*

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*1051-2276/$36.00*

*http://dx.doi.org/10.1053/j.jrn.2014.08.003*

## Methods

We developed an 11-item survey about clinic practices and clinician experiences related to eating during HD treatment. This survey was developed based on a combination of clinical experience and review of the literature.[14-16] Demographic data for each participant were also collected. The survey was distributed to attendees during the 2014 International Society of Renal Nutrition and Metabolism Conference in Wurzburg, Germany[19]; all attendees were encouraged to respond. Collected surveys were analyzed and entered into SPSS version 22 (IBM, Chicago, IL). Partial responses were included in the overall analysis. Data are reported as the number of respondents and the percent of categorical responses. A chi-square test ($\chi^2$) was used to determine practice differences between clinic settings. Significance was set using an alpha of 0.05. However, no additional statistical comparisons were performed because of the limited number of responses. Finally, qualitative data were analyzed, clustered, and summarized.

## Results

We received 73 responses from six continents (Africa [3, 4.1%], Asia [7, 9.6%], Australia [5, 6.8%], Europe [39, 53.4%], North America [9, 12.3%], and South America [10, 13.7%]). Clinicians who responded to the survey were dietitians (71.2%), nephrologists (26.0%), or clinical researchers (2.7%) who worked in units housed within a hospital (63.0%), outpatient clinic (45.2%), and/or an academic setting (16.4%).

Clinic practices for eating during HD treatment are summarized in Figure 1. Fifty-three clinics (72.6%) served food other than supplements during HD. Forty-nine of the 53 clinics who served food during treatment (92.5%) provided food at no cost to the patient. However, none of the nine clinics from North America provided food during treatment. Clinics that were in a hospital setting were more likely to provide food to patients during treatment than those that were not associated with a hospital ($\chi^2 = 3.84$, $P = .05$). Qualitative analysis of clinician responses showed that clinics providing food were generally providing full meals that tended to be high in carbohydrates. In addition, tea or coffee was often included as a beverage.

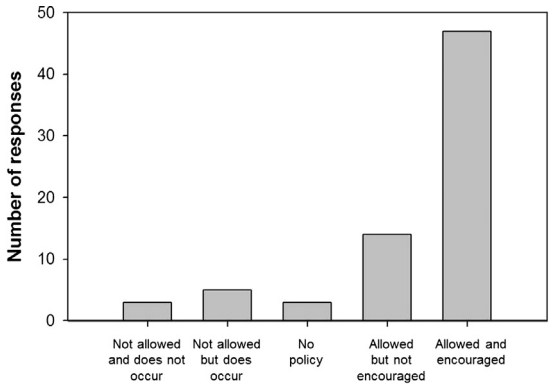


**Figure 1.** International practices for patient eating patterns during hemodialysis treatment.

Forty-seven clinicians responded that their clinics (64.4%) provided supplements during treatment. Forty-three of the 47 clinics (91.5%) provided these supplements at no cost to the patient. Outpatient clinics were less likely to provide nutritional supplements during treatment compared with clinics that were not described as outpatient ($\chi^2 = 4.35$; $P < .04$). Clinics tended to provide patients with liquid as opposed to solid supplements. These supplements were most often commercially available mixed macronutrient supplements.

We also asked clinicians about their experiences with eating during treatment. When asked whether four specific factors influenced their decision to allow patients to eat, clinicians responded that they allowed patients to eat to provide additional energy (88.7%), teaching opportunities (46.8%), better control of blood glucose (32.3%), and difficulty enforcing a no eating policy (16.1%). Additionally, clinician open-ended responses included patient quality of life, providing protein, barriers to intake outside of the clinic (i.e., lack of cooking skills, transport time, socioeconomic limitations, and so forth), clinic culture, and nutrient timing. Finally, we asked clinicians about six commonly cited reasons to restrict feeding during HD. Clinician responses are summarized in Table 1. In general, clinicians did not frequently experience these proposed consequences of eating during treatment. In addition to these commonly cited reasons, clinicians also indicated that staff workload, difficulty overcoming clinic culture, cost, and patients' forgetting binders as reasons to restrict eating during HD treatment.

## Discussion

We conducted a survey examining the practices and experiences of clinicians related to eating during HD treatment at the International Society of Renal Nutrition and Metabolism Conference in Wurzburg, Germany. Our primary findings from this survey include the following: (1) eating during dialysis is commonly allowed and frequently encouraged by clinics throughout most of the world; (2) many clinics provide food and supplements to patients at no cost; (3) providing additional energy appears to be the primary reason that clinics allow or encourage patients to eat during treatment; and (4) many of the proposed negative sequelae of eating during HD are not commonly observed in clinical practice. To our knowledge, this is the first published study to describe international practices related to eating during treatment.

Understanding the variability in clinic guidelines is an important step to outlining best practices. We observed that most clinics around the world allow, encourage, and in many cases, provide food at no cost to patients. However, none of the nine clinics from North America provided patients with food. This supports previous reports indicating

**Table 1.** Clinician Experiences With Six Commonly Cited Reasons to Restrict Eating During Hemodialysis Treatment

| Reason | Never | Rarely | Occasionally | Frequently |
|---|---|---|---|---|
| Postprandial hypotension ($n$ = 53) | 18 (34.0) | 15 (28.3) | 18 (34.0) | 2 (3.8) |
| Gastrointestinal symptoms ($n$ = 52) | 14 (26.9) | 23 (44.2) | 15 (28.8) | 0 (0.0) |
| Reduced treatment efficiency ($n$ = 45) | 42 (93.3) | 2 (4.4) | 1 (2.2) | 0 (0.0) |
| Spills or pests ($n$ = 46) | 31 (67.4) | 7 (15.2) | 5 (10.9) | 3 (6.5) |
| Choking ($n$ = 46) | 39 (84.8) | 6 (13.0) | 1 (2.2) | 0 (0.0) |
| Infection control issues ($n$ = 46) | 42 (91.3) | 2 (4.3) | 2 (4.3) | 0 (0.0) |

that practices related to eating during treatment in North America, particularly the United States, appear to be more restrictive.[14] Although the present study is underpowered to make statistical comparisons between continents or countries, this observation deserves further examination. Although speculative, this difference in clinical practice may contribute to the observation that patients' albumin levels tend to be lower, and mortality rates higher, in the United States compared with the rest of the world.[18]

Another interesting observation was that the food being provided to patients was high in carbohydrates. This is important given our finding that approximately 37% of clinicians have observed hypotension at least "sometimes." Carbohydrates have been shown to lead to a disproportionate postprandial drop in blood pressure compared with the other macronutrients[20] although this effect has not been demonstrated in patients undergoing HD. In addition, protein appears to be more effective at preventing HD-associated catabolism and inflammation[5,6] and may lead to fewer hemodynamic complications. Further research may be warranted to determine the optimal food choices during HD treatment.

We also asked clinicians about their experiences with patients eating during HD treatment. These clinical experiences contribute important evidence to the debate within the nephrology community about the best practices related to eating during treatment.[14] Providing additional energy was the primary reason that clinics allowed patients to eat during treatment. When asked about six commonly cited arguments for restricting eating during HD treatment, clinicians reported that the majority of these concerns occurred "rarely" or "never." The most frequently reported consequence of eating during treatment was intradialytic hypotension. This is consistent with previous observations that eating during treatment causes a transient reduction in blood pressure but is generally well accepted in stable patients (Kistler et al., manuscript in preparation). Describing the frequency and individual circumstances with which these symptoms occur will help clinicians make informed decisions regarding practices in this controversial area.

A primary weakness of this study was that the data were obtained from a convenience sample of clinicians attending a renal nutrition conference. These practitioners are likely to have greater interest in nutrition and may have more progressive practices in their clinic related to eating during HD treatment. In addition, this survey was written in English, which may have limited the participation of nonnative English speaking participants. We also did not receive an adequate number of responses to statistically compare continents. Despite this limitation, the group as a whole has provided valuable insight into clinical experiences with eating during treatment. Additionally, this research has raised important questions about differences in practice around the world and how these may contribute to global disparities in nutritional status and outcomes.

In summary, our results indicate that eating is common during treatment in many countries around the world, disparities may exist in global practices, and most of the proposed negative sequelae of eating during HD are not commonly observed in clinical practice. These data describe current nutrition practices, provide a potential contributor to global differences in albumin, and highlight the need for more research to inform decisions regarding eating during HD. Specifically, future research should be conducted to further characterize and evaluate international differences in eating practices, to examine the prevalence and severity of proposed consequences associated with eating during treatment, and to find ways to minimize patient risk.

## Practical Applications

This study suggests that many of the proposed negative consequences associated with eating during treatment are not commonly observed by practitioners in the clinical setting. This observation should provide insight into current practices and highlight the need for future research in this controversial area of practice.

## Acknowledgment

The authors would like to thank the International Society of Renal Nutrition and Metabolism for allowing us to distribute our survey at their conference.

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