

Intradialytic Symptoms and Recovery Time: Thinking ‘Outside the Box’ to Improve Patients’ Dialysis Experience

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In this issue of *Kidney Medicine*, Alvarez et al,¹ using responses to a National Kidney Foundation scientific survey, present an informative and timely study detailing self-reported symptoms during in-center hemodialysis and

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associations between symptoms experienced during dialysis with recovery time after dialysis treatments. Dialysis recovery time is an important concept that encapsulates challenges experienced by dialysis patients contributing to impaired health-related quality of life.²

Recovery time is measured by asking the reliable, valid, and responsive question, “How long does it take you to recover from a dialysis session?”³ Using an online symptom questionnaire modified from the Kidney Disease Quality of Life Symptoms and Problems With Kidney Disease scale,⁴ Alvarez et al queried patients’ experiences of a range of symptoms, including fatigue, low blood pressure, cramps, headache, faintness or dizziness, itchy skin, nausea or upset stomach, vomiting, shortness of breath, irregular heart rate, chest pain, and difficulty concentrating during dialysis in the previous week. A total symptom score for each patient was derived from the product of the number and average severity of symptoms. In this cross-sectional study, Alvarez et al asked about average dialysis recovery time during the previous week: “Over the last week, how long did it take you on average to recover from your dialysis sessions and resume your normal, usual activities?” They also asked about dialysis treatment non-adherence, including skipping and shortening of treatments.

Of 10,000 patients sent the online questionnaire, only 464 (4.6%) responded, raising some questions about the generalizability of the results. Nevertheless, most (87%) patients reported burdensome symptoms during dialysis, including fatigue (67%), cramps (44%), and low blood pressure (42%). Median reported dialysis recovery time was 3 hours, and this moderately correlated with the incidence and severity of intradialytic symptoms ($\tau = 0.28$; 90% CI, 0.26–0.38; $P < 0.0001$). A third of the patients credited intradialytic symptoms to shortening their dialysis treatments, and a minority (6%) of patients attributed missed dialysis sessions to their intradialytic symptoms.

This important study builds on structured assessments of dialysis-related symptom burden and its implications for the experience and delivery of the dialysis procedure. It also contributes direct confirmatory testimony from

patients that their ability to fulfill their dialysis prescription is influenced by their symptoms during treatment. Although this may not be surprising, it emphasizes the importance of assessing and addressing symptoms systematically, rigorously, and proactively as a central component of dialysis care.

Patient-centered care in dialysis requires a multifaceted approach to better understand influential patient factors⁵ and incorporation of patients’ perspectives routinely into structured care delivery.⁶ Dialysis metrics have historically focused on urea kinetics, hospitalization rates and mortality, vascular access, and other biochemical results such as serum calcium level, and infectious complications. More meaningful than all these may be initiatives to improve patients’ experiences with dialysis, including patient-reported outcomes (PROs) such as dialysis-associated symptom burden.⁷ The study results from Alvarez et al should trigger “outside the box” innovation to better understand dialysis patients’ experiences of intradialytic symptoms and thereby improve the quality of dialysis care.

It is saddening that despite efforts to improve dialysis technology during the past 3 decades,⁸ dialysis patients continue to experience severe symptoms with significant frequency during and after their dialysis treatments.¹ As shown by Alvarez et al, this symptom burden lengthens the duration of dialysis recovery time, promotes non-adherence to dialysis treatments,¹ and also results in increased hospitalization and mortality rates.⁹ Efforts to assess and address symptoms during hemodialysis, including traditional clinical practice approaches, have not made sufficient impact. Therefore, it is necessary to expand our view and develop a deliberate approach to intradialytic symptoms.

This study reinforces that the mix of symptoms experienced by patients varies, although some symptoms are more common. Only 12 symptoms were included in this study and notably absent was report of musculoskeletal or access-related pain.¹⁰ This common symptom is complex because it is frequently associated with other symptoms and illustrates that the interpretation of body sensations as symptoms results from the interrelationship between biological, psychological, social, and cultural factors (Fig 1).¹¹ Symptoms represent the interpretation of body sensations experienced by the patient that are then articulated to a clinician. Both the patient and clinician then separately determine whether the symptoms are related to and representative of disease and together they collaborate to synthesize their perspectives to determine the final plan.

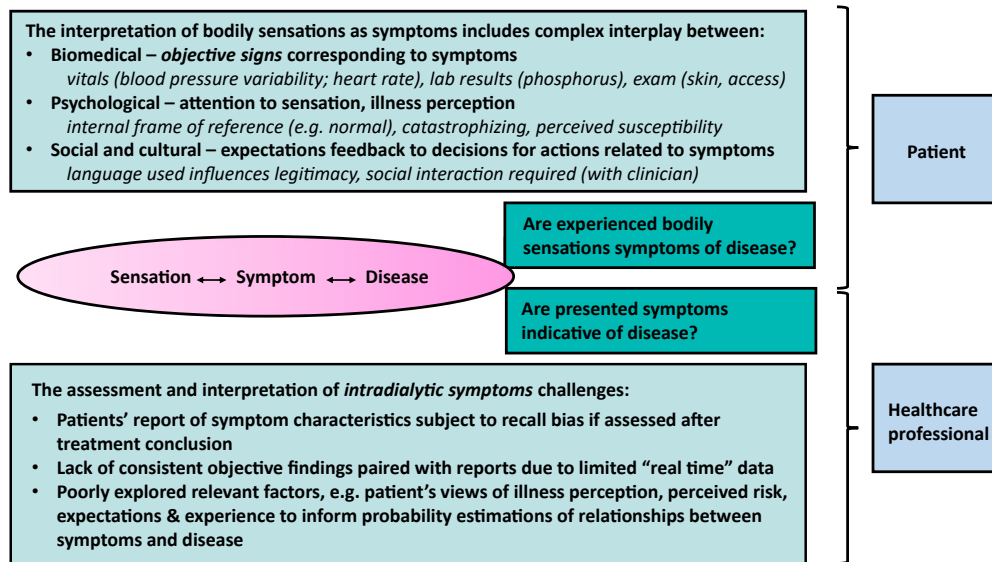


Figure 1. Multiple perspectives of intradialytic symptom interpretation. Abbreviations: exam, examination; lab, laboratory. Adapted from Rosendal et al.¹¹

The biomedical model of symptoms posits that objective signs are present along with symptoms to increase confidence in the interpretation that the symptoms represent disease. Although there is reasonable certainty that the dialysis procedure contributes to symptoms that are experienced during dialysis, there remains an opportunity to specifically link objective measures, including vital signs and their variability during the dialysis procedure, laboratory assessments during dialysis, and physical examination findings using novel body sensors, with symptoms reported by individual patients. Integrating detailed objective data from multiple sources and applying emerging machine learning strategies both to predict and ultimately prevent intradialytic symptoms may lead not only to better dialysis care but also to a reduction in the disparities observed in symptom burden, with patients who are female, younger,⁶ with higher body mass index, and living with diabetes more often afflicted.¹²

Although factors such as age and sex are nonmodifiable, dialysis prescriptions are usually modified to address physiologic factors such as rapid fluid and electrolyte shifts and changes in plasma osmolality.¹ Future strategies may include real-time adjustments in prescription informed by both objective data and patient-reported symptoms. However, objective data alone may not be sufficient to develop the most precise and accurate predictive symptom model, and other psychological, social, and cultural determinants affecting the expression of intradialytic symptoms must also be considered.

Psychological factors moderate the interpretation of body sensations as symptoms and affect symptom severity and perception.¹¹ For instance, depression has been linked to an increase in symptom perception and reporting among the elderly.¹³ Among dialysis patients, increased self-reported psychological distress is associated with

greater dialysis-related symptom burden,⁵ and higher self-reported depression scores are associated with increased dialysis recovery time.⁷ The scale used by Alvarez et al would have been strengthened by the inclusion of a psychological assessment such as psychological distress, anxiety, or situational fear.

Social and cultural factors affect dialysis patients’ perspectives on intradialytic symptoms, including ethnic origin, social support, and dialysis provider support—a reflection of the therapeutic alliance between patients and clinicians. Lack of social support has been associated with a greater increase in dialysis recovery time, perhaps due to increased perception of intradialytic symptoms.⁷ Less frequent medical contact and supervision also have been linked to increased intradialytic symptoms despite similar clinical practices across dialysis centers.⁶ Accurate interpretation of reported symptoms requires a clinician to know their patient’s underlying psychological, social, and cultural characteristics. This supports person-centered communication using cross-cultural communication and evocative, nonjudgmental, and respectful strategies.¹⁴ These strategies will facilitate effective eliciting of symptoms from patients at the time of occurrence and effective alignment of dialysis care to patients’ preferences and goals.¹⁴ Further, improved communication may enhance dialysis patients’ perceptions of providers’ support for autonomy in their care and empower patients to confidently report their symptoms.

Providing patient-centered care is a priority.¹⁵ Though daunting in clinical practice, patient centeredness is foundational to achieve high-quality health care. PROs in kidney disease facilitate the attainment of the tenets of patient-centered care, though challenges persist in incorporating them into routine practice.¹⁶ For instance, the measurement and reporting of intradialytic symptoms may

be subject to recall bias if reflecting on past treatments. Further, there are no evidence-based recommendations for the frequency of structured assessment of PROs such as intradialytic symptoms. Additionally, there is not widespread easily implementable infrastructure available to document PROs in patients' electronic medical records and care plans.¹⁶ The ability to collect and pair PRO data with other objective data sources for each and every dialysis treatment is needed to fully realize personalized medicine.

In our collective effort to improve patients' experiences with dialysis treatments and outcomes, we suggest that metrics for assessing the quality of dialysis are expanded to include PROs evaluating intradialytic symptoms in addition to measures that reflect patients' overall experiences with dialysis. We recommend embracing "outside the box" thoughts on a more deliberate and comprehensive approach to managing and ultimately preventing adverse intradialytic symptoms.

First, processes to ensure accurate and comprehensive assessment of intradialytic symptoms must be developed, validated, implemented, and disseminated. Key symptoms such as pain specific to the dialysis procedure must be included. Psychological factors such as anxiety and fear related to dialysis should be measured, and depression should be assessed as a covariate.

Second, we should optimize dialysis provider cultural competence and promote use of communication strategies to strengthen the therapeutic alliance between patients and clinicians. This is necessary to encourage patients to report their symptoms and experiences with dialysis, empower them to participate in shared decision making, and ultimately motivate them to adhere to their dialysis treatment care plan.

Finally, we hypothesize that addressing intradialytic symptoms at the time of occurrence has the greatest potential to improve patients' experiences with dialysis, improve adherence to dialysis prescription, reduce recovery time, and improve other dialysis-related outcomes. Therefore, we should explore ways to deliver "smart" dialysis, incorporating innovative ways to measure intradialytic symptoms in real time and eliminate concerns for recall bias. Given the anticipated positive clinical and financial impact of this technological advancement through significant reductions in hospitalizations and health care costs, real-time measurement of dialysis symptoms integrated with all available biometric data should not be regarded as an elusive goal. Rather, it should be mandated as the standard of care in dialysis.

ARTICLE INFORMATION

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Support: Dr Umeukeje is supported by K23DK114566 and Dr Cavanaugh is supported by R01DK103935.

Financial Disclosure: The authors declare that they have no relevant financial interests.

Peer Review: Received January 21, 2020, in response to an invitation from the journal. Direct editorial input by an Associate Editor and the Editor-in-Chief. Accepted in revised form February 14, 2020.

Publication Information: © 2020 The Authors. Published by Elsevier Inc. on behalf of the National Kidney Foundation, Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Published online February 28, 2020 with doi [10.1016/j.xkme.2020.02.001](https://doi.org/10.1016/j.xkme.2020.02.001)

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