Medical Nutrition Therapy Access in CKD: A Cross-sectional Survey of Patients and Providers

Elizabeth Yakes Jimenez, Kathryn Kelley, Marsha Schofield, Deborah Brommage, Alison Steiber, Jenica K. Abram, and Holly Kramer

Rationale & Objective: Nutrition management can slow the progression of chronic kidney disease (CKD) and help manage complications of CKD, but few individuals with CKD receive medical nutrition therapy before initiating dialysis. This study aimed to identify knowledge, attitudes, experiences, and practices regarding medical nutrition therapy and barriers and facilitators to medical nutrition therapy access for individuals with CKD stages G1-G5 from the perspective of patients and providers.

Study Design: Cross-sectional study composed of anonymous surveys.

Setting & Population: Adults with CKD stages G1-G5 and medical providers and registered dietitian nutritionists who regularly see patients with CKD stages G1-G5 were recruited by email using National Kidney Foundation and Academy of Nutrition and Dietetics databases and through the National Kidney Foundation 2019 Spring Clinical Meetings mobile app.

Analytical Approach: Descriptive analyses and Fisher exact tests were conducted with Stata SE 16.

Results: Respondents included 348 patients, 66 registered dietitian nutritionists, and 30 medical providers. In general, patients and providers had positive perceptions of medical nutrition therapy and its potential to slow CKD progression and manage complications, and most patients reported interest in a medical nutrition therapy referral. However, there were feasibility concerns related to cost to the patient, lack of insurance coverage, and lack of renal registered dietitian nutritionists. There was low awareness of Medicare no-cost share coverage for medical nutrition therapy across patients and providers. About half the practices did not bill for medical nutrition therapy and those that did reported issues with being paid and low reimbursement rates.

Limitations: Results may not be generalizable due to the small number of respondents and the potential for self-selection, nonresponse, and social desirability bias.

Conclusions: Many patients with CKD stages G1-G5 are interested in medical nutrition therapy and confident that it can help with disease management, but there are feasibility concerns related to cost to the patient, insurance coverage, and reimbursement. There are significant opportunities to design and test interventions to facilitate medical nutrition therapy access for patients with CKD stages G1-G5.

Chronic kidney disease (CKD) affects ~15% of the US adult population, imposing significant burden on individuals and health systems. CKD is categorized into grades 1 to 5 (G1-G5) based on estimated glomerular filtration rate. Individuals with CKD stages G1-G4 have higher levels of kidney function, whereas CKD stage G5 indicates kidney failure and often requires kidney replacement therapy by dialysis (G5D) or a kidney transplant (G5T) for survival. Individuals with CKD stages G1-G4 represent the majority of people living with the disease, and they incur significant treatment costs that increase as CKD progresses. Because Medicare expenditures increase from an estimated $19,737 to $29,285 per beneficiary per year from mild to severe CKD, clinicians should use interventions such as medical nutrition therapy to slow or halt CKD progression and reduce health care costs.

Medical nutrition therapy provided by a registered dietitian nutritionist is recommended for all individuals with CKD. Medical nutrition therapy includes a complete nutrition assessment, diagnosis of nutrition problems, individualized intervention, and careful monitoring and evaluation to promote lifestyle modifications that will slow or prevent CKD progression. In addition, medical nutrition therapy can mitigate the impact of associated comorbid conditions, including type 2 diabetes, obesity, hypertension, and hyperlipidemia. Currently, Medicare covers medical nutrition therapy for patients with estimated glomerular filtration rates of 13 to 50 mL/min/1.73 m², consistent with CKD stages G3-G5, with no cost-sharing. However, the overwhelming majority of individuals with CKD never receive medical nutrition therapy before initiating dialysis.

Many barriers may prevent individuals with CKD stages G1-G5 from accessing medical nutrition therapy. Providers who do not diagnose early-stage CKD are unlikely to refer their patients to a registered dietitian nutritionist for medical nutrition therapy, and individuals who are unaware of their disease will not seek medical nutrition therapy. Also, despite existing evidence-based practice guidelines, providers may be unaware or unconvinced of medical nutrition therapy as a tool to reduce CKD progression. Logistical challenges, such as availability of practitioners, transportation, and time, are other common barriers that reduce patient access to registered
dietitian nutritionists with expertise in kidney disease, known as renal registered dietitian nutritionists. Although limited research exists regarding access to CKD nutrition care, studies on access to diabetes self-management training have noted that patients who are most vulnerable, including non-Whites, older individuals, those with comorbid conditions, and the newly diagnosed, were least likely to access care.

This cross-sectional study aims to describe knowledge, attitudes, experiences, and practices regarding medical nutrition therapy for patients with CKD stages G1-G5 and to understand the barriers and facilitators to accessing medical nutrition therapy for patients with CKD stages G1-G5, from the perspectives of patients, registered dietitian nutritionists, and medical providers.

**METHODS**

This study consisted of cross-sectional anonymous online surveys administered to patients with CKD stages G1-G5 and registered dietitian nutritionists and medical providers who regularly see patients with CKD stages G1-G5. Surveys were determined to be an appropriate method to measure knowledge, attitudes, experiences, and practices regarding medical nutrition therapy and beliefs about barriers and facilitators. The surveys were a first step toward designing appropriate interventions to increase access to and use of medical nutrition therapy for patients with CKD stages G1-G5.

This report was developed using a reporting guideline for survey studies. The study protocol (#19-111) was approved by the University of New Mexico Human Research Protections Office. All participants reviewed an informed consent document and agreed to participate.

**Survey Development**

Initially, the study team reviewed the literature to identify barriers and potential solutions to increase medical nutrition therapy access for patients with CKD. All questions on the patient, registered dietitian nutritionist, and medical provider surveys were jointly developed and revised by the study team, which included a nephrologist (H.K.); registered dietitian nutritionists with renal nutrition (D.B. and A.S.), billing and coding (M.S.), and epidemiology (E.Y.J.) expertise; and a data analyst (K.K.). Surveys were designed to include parallel questions assessing the same topic areas from the perspectives of each audience. The surveys were reviewed by the Academy of Nutrition and Dietetics’ (Academy’s) Survey Review Subcommittee under the Council on Research, which assesses aspects of survey design. Final survey questions are included in Item S1.

**Survey Instruments**

The patient survey included 21 questions. The initial questions on the patient survey assessed eligibility, with patients 18 years or older with CKD stages G1-G5 included. The patient survey then included sociodemographic questions, as well as questions regarding insurance coverage, previous experience with a registered dietitian nutritionist, and health history. Patients were asked to rate their agreement, on a 5-point scale of strongly disagree to strongly agree, with statements related to the importance of medical nutrition therapy and lifestyle changes in managing CKD; helpfulness of lifestyle change supports; their self-efficacy, confidence, and interest in changing their lifestyle; their interest in being referred to a registered dietitian nutritionist; and beliefs about potential barriers related to seeing a registered dietitian nutritionist. Finally, the survey included 3 true or false questions assessing patient awareness of Medicare coverage of medical nutrition therapy for CKD.

The registered dietitian nutritionist and medical provider surveys were similar and included 24 questions. The initial questions on both surveys assessed eligibility, with practicing providers in the United States or territories seeing on average at least 5 adult patients with CKD stages G1-G5 per month included. The surveys then assessed demographic and practice characteristics. Providers were asked to rate their agreement, on a 5-point scale of strongly disagree to strongly agree, with statements related to the importance of medical nutrition therapy and lifestyle changes in managing CKD, beliefs about patient self-efficacy in making lifestyle changes, helpfulness of patient lifestyle change supports, beliefs about potential barriers to medical nutrition therapy referral, level of professional connection to others providing care to patients with CKD, and beliefs about the adequacy of the
renal registered dietitian nutritionist workforce. Next, the registered dietitian nutritionist survey asked a series of questions about receiving referrals for patients with CKD, whereas the medical provider survey asked how often they refer patients with CKD for medical nutrition therapy and about routine use of the CKD Clinical Pathway resource. Awareness of Medicare coverage of medical nutrition therapy for CKD was assessed using 3 true or false questions. Finally, there were questions assessing experience with billing, coding, and reimbursement for medical nutrition therapy services.

**Survey Administration**

Recruitment alerts for the medical provider and registered dietitian nutritionist surveys were broadcast through the National Kidney Foundation’s (NKF’s) 2019 Spring Clinical Meetings mobile application between May 8 and 12, 2019. The application was freely available for download, and the recruitment alerts were viewed by 139 registered dietitian nutritionists and 58 medical providers. The meeting was attended by 1,210 physicians, 298 advanced practitioners, and 434 registered dietitian nutritionists.

Additionally, the study team used the NKF constituent database to identify adult patients with CKD and medical providers who care for patients with CKD and distributed the survey recruitment message by email. A total of 7,698 medical providers and 2,700 patients with CKD who were not receiving dialysis were invited to participate. The study team also distributed the recruitment message by email to 1,887 members of the Academy Renal Dietitians practice group and 421 Board Certified Specialists in Renal Nutrition. For this wave of distribution, the survey was open between June 6 and 28, 2019, and reminder emails were sent 1 week after the initial invitation.

Four hundred five individuals responded to the patient survey; 361 were eligible and 348 completed the survey (13% response rate). One hundred sixty-six individuals responded to the registered dietitian nutritionist survey, among whom 68 were eligible and 66 completed the survey. Forty individuals responded to the medical provider survey, among whom 31 were eligible and 30 completed the survey. It is difficult to calculate an accurate response rate for medical providers and registered dietitian nutritionists because the number of eligible individuals using the NKF Spring Clinical Meeting application and in the NKF databases is unknown because some providers care primarily for patients receiving dialysis. We also do not know how many of the emails were successfully delivered.

**Data Management and Analysis**

Survey data were collected and managed using REDCap (Research Electronic Data Capture) electronic data capture tools hosted at the University of New Mexico. REDCap is a secure web-based application to support data capture for research studies. Survey data were descriptively analyzed.

**Table 1. Self-reported Demographic Characteristics of Participating Adult Patients With Non–Dialysis-Dependent CKD**

| Characteristic | No. | %  |
|---------------|-----|----|
| **Sex**       |     |    |
| Female        | 249 | 71.6|
| Male          | 98  | 28.2|
| Nonbinary     | 1   | 0.3 |
| **Race**      |     |    |
| White or Caucasian | 287 | 82.5|
| Black or African American | 25  | 7.2 |
| Asian         | 8   | 2.3 |
| American Indian or Alaska Native | 7   | 2.0 |
| Native Hawaiian or other Pacific Islander | 2   | 0.6 |
| Other (self-described)/multiple | 13  | 3.7 |
| Prefer not to answer | 6   | 1.7 |
| **Ethnicity** |     |    |
| Hispanic or Latino/a | 25  | 7.4 |
| **Age group** |     |    |
| 18-24 y       |     |    |
| 25-34 y       | 8   | 2.3 |
| 35-44 y       | 21  | 6.0 |
| 45-54 y       | 53  | 15.2|
| 55-64 y       | 93  | 26.7|
| 65-74 y       | 113 | 32.5|
| 75-84 y       | 53  | 15.2|
| ≥85 y         | 6   | 1.7 |
| Prefer not to answer | 1   | 0.3 |
| **Marital status** |     |    |
| Married or domestic partnership | 222 | 64.2|
| Divorced      | 57  | 16.5|
| Never married | 33  | 9.5 |
| Widowed       | 24  | 6.9 |
| Separated     | 4   | 1.2 |
| Prefer not to answer | 6   | 1.7 |
| **Education level** |     |    |
| Some high school, no diploma | 7  | 2.0 |
| High school diploma or equivalent (GED) | 46 | 13.3 |
| Some college, no degree | 73 | 21.0 |
| Associate degree | 38 | 11.0 |
| Bachelor’s degree | 97 | 28.0 |
| Advanced degree (eg, master’s, doctorate) | 71 | 20.5 |
| Professional degree (eg, MD, JD) | 11 | 3.2 |
| Prefer not to answer | 4 | 1.2 |
| **Employment status** |     |    |
| Retired       | 167 | 45.5|
| Full-time employee (≥30 h/wk) | 89 | 24.3 |
| Unemployed due to disability or health-related reason | 41 | 11.2 |
| Part-time employee (<30 h/wk) | 33 | 9.0 |
| Homemaker     | 17  | 4.6 |
| Volunteer     | 8   | 2.2 |
| Unemployed and currently looking for work | 5 | 1.4 |
| Student       | 3   | 0.8 |
| Unemployed and not currently looking for work | 2 | 0.5 |
| Prefer not to answer | 2 | 0.5 |
| **Insurance type** |     |    |
| 141 | 40.5 | (Continued)
using Stata SE 16 (StataCorp LLC). Likert scale responses were analyzed as categorical variables. Fisher exact tests were used to assess relationships between variables. *P* < 0.05 was considered statistically significant.

### RESULTS

#### Respondent Characteristics

Patient characteristics are reported in Table 1. Most respondents reported that they were women, White, and 55 years or older with CKD stages G3-G4 (80%). Most participants had lived with CKD for more than 5 years, have hypertension (82%), and had health insurance coverage since they received their diagnosis. The most frequently reported insurance type was Medicare (69%). Overall, 48% of patient participants had never seen a registered dietitian nutritionist and nearly half reported that medical providers have never suggested they should see a registered dietitian nutritionist. About one-third of patient participants had type 2 diabetes or prediabetes and were significantly more likely to have seen a registered dietitian nutritionist than patient participants without a diabetes diagnosis (*P* < 0.01).

Registered dietitian nutritionist characteristics are reported in Table 2. Most registered dietitian nutritionists had been practicing for 11 or more years (70%) and have a master’s degree (55%). Responding registered dietitian nutritionists worked in a wide variety of employment settings. Nearly 40% were Board Certified Specialists in Renal Nutrition.

Medical provider characteristics are reported in Table 3. All responding medical providers reported nephrology as their primary area of clinical practice. Eighteen were physicians and 12 were advanced practice providers. Most medical providers had 11 or more years of practice experience caring for patients with CKD (69%) in a variety of settings. Around two-thirds primarily serve patients with Medicare. Fifty-three percent noted that a registered

### Table 1 (Cont’d). Self-reported Demographic Characteristics of Participating Adult Patients With Non–Dialysis-Dependent CKD

| Characteristic                                      | No. | %  |
|----------------------------------------------------|-----|----|
| A plan through my employer or a family member’s employer |     |    |
| Medicare                                           | 127 | 36.5 |
| Medicare Advantage Plan (MA Plan)                  | 58  | 16.7 |
| Medicare Supplemental Insurance                     | 54  | 15.5 |
| Medicaid                                           | 26  | 7.5  |
| A plan I purchased myself                           | 21  | 6.0  |
| Another type of coverage                            | 20  | 5.7  |
| Affordable Care Act Plan (Healthcare.gov)          | 10  | 2.9  |
| I’m not covered by health insurance                 | 3   | 0.9  |
| Prefer not to answer                                | 8   | 2.3  |

#### Insurance coverage

| Characteristic                                      | No. | %  |
|----------------------------------------------------|-----|----|
| I’ve been covered by health insurance the entire time | 315 | 91.0 |
| I’ve been covered by health insurance part of the time | 20  | 5.8  |
| I have not been covered by health insurance at all   | 3   | 0.9  |
| I don’t know                                        | 3   | 0.9  |
| Prefer not to answer                                | 5   | 1.4  |

#### CKD stage

| Characteristic                                      | No. | %  |
|----------------------------------------------------|-----|----|
| Stage 1                                             | 5   | 1.4  |
| Stage 2 mild CKD                                    | 21  | 6.0  |
| Stage 3A moderate CKD                               | 81  | 23.3 |
| Stage 3B moderate CKD                               | 85  | 24.4 |
| Stage 4 severe CKD                                  | 113 | 32.5 |
| Stage 5, not on dialysis                            | 32  | 9.2  |
| Unsure                                              | 11  | 3.2  |

#### Years living with CKD

| Characteristic                                      | No. | %  |
|----------------------------------------------------|-----|----|
| <2 y                                               | 49  | 15.7 |
| 3-5 y                                              | 92  | 29.4 |
| 6-10 y                                             | 84  | 26.8 |
| >11 y                                              | 88  | 28.1 |

#### Has a doctor ever told you that you have prediabetes or diabetes?

| Characteristic                                      | No. | %  |
|----------------------------------------------------|-----|----|
| No                                                 | 206 | 61.7 |
| I’m not sure                                        | 9   | 2.7 |
| Yes: type of diabetes                               | 119 | 35.6 |
| Prediabetes                                         | 37  | 11.1 |
| Type 2 diabetes                                     | 78  | 23.5 |
| Type 1 diabetes                                     | 7   | 2.1 |
| Gestational diabetes                                | 3   | 0.9 |
| I’m not sure                                        | 2   | 0.6 |

#### Has a doctor ever told you that you have hypertension or high blood pressure?

| Characteristic                                      | No. | %  |
|----------------------------------------------------|-----|----|
| Yes                                                | 277 | 82.4 |
| No                                                  | 56  | 16.7 |
| I’m not sure                                        | 3   | 0.9 |

#### Has a doctor or other health professional ever suggested that you see an RDN?

| Characteristic                                      | No. | %  |
|----------------------------------------------------|-----|----|
| Yes                                                | 152 | 45.2 |
| No                                                  | 164 | 48.8 |
| I’m not sure                                        | 20  | 6.0 |

#### Have you ever seen an RDN?

| Characteristic                                      | No. | %  |
|----------------------------------------------------|-----|----|
| Yes                                                | 170 | 50.7 |
| No                                                  | 160 | 47.8 |

Note: *n* = 348. The use of "non–dialysis-dependent CKD" and CKD stages reflects the terminology used in the surveys, which was appropriate at the time. Since then, new KDIGO Nomenclature for Kidney Function and Disease have been developed and are used elsewhere in this article.

Abbreviation: CKD, chronic kidney disease; GED, General Educational Development; KDIGO, Kidney Disease: Improving Global Outcomes; RDN, registered dietitian nutritionist.

*Respondents could select more than 1 type of diabetes, if applicable.

---

Kidney Med Vol 3 | Iss 1 | January/February 2021

Jimenez et al
dietitian nutritionist was included on their clinical team, with 50% having a registered dietitian nutritionist on site. Most medical providers reported that they often or always refer patients with CKD stages G3-G5 to a registered dietitian nutritionist for medical nutrition therapy (73%) but never or rarely refer patients with CKD stages G1-G2 (63%). Medical providers who had a registered dietitian nutritionist co-located at their practice reported often or always referring patients with CKD stages G3-G5 to a registered dietitian nutritionist more than medical providers without a registered dietitian nutritionist on site (87% vs 60%). About 80% of medical providers reported that their practices were currently conducting some type of quality improvement activities.

Table 2. Self-reported Demographic Characteristics of Participating United States–Based RDNs Who Regularly See Adult Patients With Non–Dialysis-Dependent Chronic Kidney Disease

| Characteristic | No. | %  |
|---------------|-----|----|
| Years practicing as an RDN |     |    |
| ≤2 y          | 3   | 4.5|
| 3-5 y         | 7   | 10.6|
| 6-10 y        | 10  | 15.2|
| 11-20 y       | 12  | 18.2|
| >20 y         | 34  | 51.5|
| Highest completed degree |     |    |
| Baccalaureate | 29  | 43.9|
| Master’s      | 36  | 54.5|
| Doctorate     | 1   | 1.5|
| Employment setting* |     |    |
| Freestanding dialysis center, chain | 19  | 28.8|
| Own private practice | 13  | 19.7|
| Hospital dialysis center | 9   | 13.6|
| Hospital kidney transplant program | 8   | 12.1|
| Nephrology practice offering medical nutrition therapy | 8   | 12.1|
| Freestanding dialysis center, non-chain | 7   | 10.6|
| Chronic kidney disease clinic (hospital setting) | 7   | 10.6|
| Physician office | 5   | 7.6|
| Home health/home infusion company | 1   | 1.5|
| Community health center | 1   | 1.5|
| Other         | 16  | 24.2|
| Professional credentials |     |    |
| Board Certified Specialist in Renal Nutrition (CDR) | 26  | 39.4|
| CDE: Certified Diabetes Educator (National Certification Board for Diabetes Educators) | 7   | 10.6|
| Board Certified Specialist in Obesity and Weight Management (CDR) | 2   | 3.0|
| Other         | 7   | 10.6|

Note: n = 66. The use of “non–dialysis-dependent chronic kidney disease” reflects the terminology used in the surveys, which was appropriate at the time. Since then, new KDIGO Nomenclature for Kidney Function and Disease have been developed and are used elsewhere in this article. Abbreviations: CKD, chronic kidney disease; KDIGO, Kidney Disease: Improving Global Outcomes; RDN, registered dietitian nutritionist.

*RDNs could select more than 1 employment setting, if applicable.

Table 3. Self-reported Demographic Characteristics of Participating United States–Based Medical Providers Who Regularly See Adult Patients With Non–Dialysis-Dependent CKD

| Characteristic | No. | %  |
|---------------|-----|----|
| Years practicing as a medical provider |     |    |
| ≤2 y          | 2   | 6.7|
| 3-5 y         | 1   | 3.3|
| 6-10 y        | 4   | 13.3|
| 11-20 y       | 10  | 33.3|
| ≥20 y         | 13  | 43.3|
| Years taking care of patients with CKD |     |    |
| ≤2 y          | 2   | 6.9|
| 3-5 y         | 1   | 3.4|
| 6-10 y        | 6   | 20.7|
| 11-20 y       | 8   | 27.6|
| ≥20 y         | 12  | 41.4|
| Other members of clinical team in practice that care for patients with CKD |     |    |
| Certified clinical nurse specialists, nurse practitioners, or advanced practice registered nurses | 24  | 80.0|
| Registered nurses | 18  | 60.0|
| Registered dietitian nutritionists | 16  | 53.3|
| Social workers | 12  | 40.0|
| Interns/residents | 10  | 33.3|
| Fellows | 10  | 33.3|
| Physician assistants | 4   | 13.3|
| Care coordinator or manager | 2   | 6.7|
| Promotoras/community health workers | 1   | 3.3|
| Other | 3   | 10.0|
| Majority owner of practice |     |    |
| Independent practice majority owned by the physicians in the practice | 10  | 33.3|
| Hospital or health system | 10  | 33.3|
| Independent practice majority owned by a medical group/physician owned practice group | 3   | 10.0|
| Faculty/university practice plan | 3   | 10.0|
| Department of Veterans Affairs, Department of Defense, or other government | 3   | 10.0|
| Industry | 1   | 3.3|
| Most commonly, patients in my practice have the following primary payers: |     |    |
| Medicare (all types) | 20  | 66.7|
| Private insurance (all types) | 3   | 10.0|
| Medicaid (all types) | 2   | 6.7|
| Other public insurance | 2   | 6.7|
| I don’t know | 2   | 6.7|
| Other | 1   | 3.3|
| Quality improvement activities |     |    |
| Have a quality improvement committee | 18  | 60.0|
| Have a process for identifying quality improvement goals and track progress toward goals | 13  | 43.3|
| Have a practice leader(s) who drives forward quality improvement | 11  | 36.7|
| Have a system for using data to measure progress toward quality improvement goals | 10  | 33.3|
| Work with a quality improvement coach/facilitator | 7   | 23.3|
| Use a quality improvement process such as Lean, Six Sigma, PDSA cycles, or other | 5   | 16.7|

(Continued)
Most participants agreed that medical nutrition therapy is important in preventing the progression of CKD stages G1-G5 and most agreed that patients are interested in being referred to a registered dietitian nutritionist for medical nutrition therapy. Despite these generally positive attitudes toward medical nutrition therapy, all 3 groups had concerns about the feasibility of medical nutrition therapy access. Less than half the medical providers, registered dietitian nutritionists, and patients agreed that patients can easily afford to see a registered dietitian nutritionist. Most patients (63%) agreed or strongly agreed that they can easily attend another appointment to see a registered dietitian nutritionist; however, fewer than half the medical providers and registered dietitian nutritionists believed that patients can easily attend another appointment. Medical providers generally reported that they have time to refer patients with CKD to a registered dietitian nutritionist, but registered dietitian nutritionists were less sure about whether medical providers had time. Inadequate insurance coverage for medical nutrition therapy for patients with CKD stages G1-G5 was a concern among both registered dietitian nutritionists and medical providers. Although most medical providers (72%) and registered dietitian nutritionists (86%) agreed or strongly agreed that they are professionally connected with one another, both groups also reported that there are not enough registered dietitian nutritionists with expertise in renal nutrition to provide care.

### Patient and Provider Knowledge of Medicare No-Cost Share Coverage of Medical Nutrition therapy for Patients With CKD Stages G3-G5

Table 5 summarizes patient and provider knowledge of Medicare no-cost share coverage of medical nutrition therapy for patients with CKD stages G3-G5. Most medical providers and patients were unaware of Medicare coverage for medical nutrition therapy. Although registered dietitian nutritionists were the most knowledgeable regarding Medicare coverage of medical nutrition therapy, many were not knowledgeable about coverage with a second referral, or coverage beyond the first year that a patient receives medical nutrition therapy.

### Provider Experience With Billing, Coding, and Reimbursement for Medical Nutrition Therapy Services for Patients With CKD Stages G1-G5

About half the registered dietitian nutritionists (49%) and medical providers (57%) stated that their practice does not currently bill for medical nutrition therapy, and most reported that their practices also did not bill for medical nutrition therapy in the past. Among those who billed in the past and then stopped, the most common reason they stopped billing was that the process was too complicated. One-third of medical providers and 9% of registered dietitian nutritionists did not know if their practice currently bills for medical nutrition therapy.
Patient management systems or patient registries make it easy to identify patients with NDD-CKD who should be referred for MNT. Medical providers can effectively assist patients in making lifestyle changes to address NDD-CKD. Nutrition handouts and/or handheld device applications (eg, a smart phone app) can assist patients in making lifestyle changes to address NDD-CKD. Medical providers have adequate time to refer patients with NDD-CKD to an RDN. Lifestyle changes can reduce complications in CKD/chronic diseases. I/patients with NDD-CKD are interested in being referred to an RDN. I/patients with NDD-CKD can easily attend another appointment to see an RDN. Electronic medical records are set up to make it easy to refer patients with NDD-CKD to an RDN. Patient management systems or patient registries make it easy to identify patients with NDD-CKD who should be referred for MNT.

Table 4. Patient and Provider Attitudes and Beliefs Regarding Medical Nutrition Therapy for Patients With Non–Dialysis-Dependent CKD

| MNT is important in preventing the progression of NDD-CKD. | Strongly Disagree | Disagree | I'm Not Sure | Agree | Strongly Agree |
|-----------------------------------------------------------|-------------------|---------|--------------|-------|---------------|
| Medical providers                                         | 1 (3.3%)          | 0 (0%)  | 2 (6.7%)     | 13 (43.3%) | 14 (46.7%)    |
| RDNs                                                      | 1 (1.5%)          | 0 (0%)  | 0 (0%)       | 4 (6.1%)  | 61 (92.4%)    |
| Patients                                                  | 2 (0.6%)          | 12 (3.6%) | 57 (17.2%)  | 121 (36.4%) | 140 (42.2%)  |

| Lifestyle changes can reduce complications in CKD/chronic diseases. | Medical providers | RDNs | Patients |
|---------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                   | 1 (3.3%)          | 0 (0%) | 0 (0%)   |
| RDNs                                                                | 1 (1.5%)          | 0 (0%) | 0 (0%)   |
| Patients                                                            | 5 (1.5%)          | 1 (0.3%)| 22 (6.5%)|

| l/most patients are capable of making lifestyle changes to reduce complications from CKD/chronic disease. | Medical providers | RDNs | Patients |
|-----------------------------------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                                           | 1 (3.3%)          | 4 (13.3%) | 9 (30.0%) |
| RDNs                                                                                      | 0 (0%)            | 6 (9.1%) | 8 (12.1%) |
| Patients                                                                                  | 5 (1.5%)          | 2 (0.6%) | 27 (8.1%) |

| Nutrition handouts and/or handheld device applications (eg, a smart phone app) can assist patients in making lifestyle changes to address NDD-CKD. | Medical providers | RDNs | Patients |
|-------------------------------------------------------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                                                                  | 1 (3.3%)          | 6 (20.0%) | 9 (30.0%) |
| RDNs                                                                                                              | 8 (12.3%)         | 20 (30.8%) | 16 (24.6%) |
| Patients (handouts)                                                                                               | 32 (9.7%)         | 67 (20.3%) | 70 (21.2%) |

| Medical providers can effectively assist patients in making lifestyle changes to address NDD-CKD. | Medical providers | RDNs | Patients |
|-----------------------------------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                                           | 1 (3.3%)          | 0 (0%) | 1 (3.3%) |
| RDNs                                                                                      | 3 (4.7%)          | 18 (28.1%) | 11 (17.2%) |
| Patients                                                                                  | 50 (15.1%)        | 62 (18.7%) | 58 (17.5%) |

| l/patients with NDD-CKD can easily afford to see an RDN. | Medical providers | RDNs | Patients |
|-----------------------------------------------------------|-------------------|------|----------|
| Medical providers                                         | 6 (20.0%)         | 9 (30.0%) | 8 (26.7%) |
| RDNs                                                      | 9 (13.6%)         | 18 (273%) | 16 (24.2%) |
| Patients                                                  | 50 (15.1%)        | 43 (13.0%) | 92 (27.7%) |

| l/patients with NDD-CKD can easily attend another appointment to see an RDN. | Medical providers | RDNs | Patients |
|-----------------------------------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                                           | 1 (3.3%)          | 10 (33.3%) | 9 (30.0%) |
| RDNs                                                                                      | 6 (9.2%)          | 13 (20.0%) | 22 (33.8%) |
| Patients                                                                                  | 23 (7.0%)         | 29 (8.8%) | 69 (21.0%) |

| l/patients with NDD-CKD are interested in being referred to an RDN. | Medical providers | RDNs | Patients |
|---------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                   | 1 (3.3%)          | 2 (6.7%) | 9 (30.0%) |
| RDNs                                                                | 0 (0%)            | 6 (9.1%) | 12 (18.2%) |
| Patients                                                            | 22 (6.7%)         | 38 (11.6%) | 67 (20.4%) |

| Medical providers have adequate time to refer patients with NDD-CKD to an RDN. | Medical providers | RDNs | Patients |
|--------------------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                               | 1 (3.3%)          | 4 (13.3%) | 1 (3.3%) |
| RDNs                                                                          | 5 (7.6%)          | 10 (15.2%) | 16 (24.2%) |
| Patients                                                                       | 21 (6.1%)         | 24 (7.2%) | 20 (5.9%) |

| Electronic medical records are set up to make it easy to refer patients with NDD-CKD to an RDN. | Medical providers | RDNs | Patients |
|-----------------------------------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                                           | 5 (16.7%)        | 8 (26.7%) | 3 (10.0%) |
| RDNs                                                                                      | 13 (19.7%)       | 15 (22.7%) | 22 (33.3%) |

| Patient management systems or patient registries make it easy to identify patients with NDD-CKD who should be referred for MNT. | Medical providers | RDNs | Patients |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------|------|----------|
| Medical providers                                                                                                             | 3 (10.0%)        | 8 (26.7%) | 7 (23.3%) |
| RDNs                                                                            | 9 (13.8%)        | 14 (21.5%) | 27 (41.5%) |

Among the 42% of registered dietitian nutritionists who report currently billing for medical nutrition therapy, all reported using Current Procedural Terminology codes 97802 (initial assessment and intervention, individual) and 97803 (reassessment or intervention, individual). Only a few used codes G0270 and G0271 (Healthcare Common Procedure Coding System codes used for additional hours of services in the same year). Most practices that billed reported submitting medical nutrition therapy claims to the following payers: Medicare (96%), private insurance (93%), self-pay patients (including uninsured patients; 70%), and Medicaid (59%). Issues that practices reported encountering include billing for medical nutrition therapy and not getting paid, being paid a very low rate for medical nutrition therapy, and being unable to bill for medical nutrition therapy services the same day as a medical provider office visit.
There are enough RDNs with expertise in renal nutrition to refer to/provide care in our community connected to medical providers who care for patients with NDD-CKD.

There was low awareness of that have to be covered by some health plans since passage of the Affordable Care Act. There was some indication that patients with diabetes and diabetes treatment in many states and to relevant US Preventive Services Task Force grade B recommendations that have to be covered by some health plans since passage of the Affordable Care Act. There was low awareness of Medicare no-cost share coverage for medical nutrition therapy across patients and providers. About half the practices did not bill for medical nutrition therapy, and of those that did, there were issues related to being paid and low reimbursement rates.

Only 3 medical providers (10%) reported that their practice currently submits medical nutrition therapy claims, and 2 of the 3 providers did not know which codes were used, for which payer types their practice submits claims, or whether their practice has experienced issues with billing.

**DISCUSSION**

This study found that patients, registered dietitian nutritionists, and medical providers generally had positive perceptions of medical nutrition therapy and its potential to slow CKD progression and help manage complications of CKD, and most patients reported that they would be interested in being referred to a registered dietitian nutritionist for medical nutrition therapy. However, there were feasibility concerns associated with access to medical nutrition therapy, such as cost to the patient and a reported lack of available renal registered dietitian nutritionists. In some cases, feasibility concerns differed between providers and patients; for example, most patients thought they could easily attend another appointment to see a registered dietitian nutritionist and that they were capable of making lifestyle changes, but medical providers and registered dietitian nutritionists were less confident on these aspects. There was some indication that patients with diabetes and patients being served by practices with a co-located registered dietitian nutritionist may be more likely to receive medical nutrition therapy services. Patients with diabetes may be more likely to receive medical nutrition therapy services due to mandated insurance coverage for diabetes treatment in many states and to relevant US Preventive Services Task Force grade B recommendations that have to be covered by some health plans since passage of the Affordable Care Act. There was low awareness of Medicare no-cost share coverage for medical nutrition therapy across patients and providers. About half the practices did not bill for medical nutrition therapy, and of those that did, there were issues related to being paid and low reimbursement rates.

Many of the perceived barriers to medical nutrition therapy access for patients with CKD stages G1-G5 found in this study are consistent with the existing literature. Specifically, previous studies with patients have reported cost and transportation issues as barriers that limit or prevent access to medical nutrition therapy services for CKD, and medical providers and registered dietitian nutritionists seem to share these concerns. However, in this study, feasibility concerns regarding time and self-efficacy sometimes differed between providers and patients, indicating a potential opportunity for more patient-centered care and shared decision making around medical nutrition therapy referral. In addition, telenutrition services provided by a registered dietitian nutritionist for patients with CKD may address time and transportation issues and have improved health outcomes and patient satisfaction for individuals with other chronic conditions. Rapid changes in telehealth implementation and coverage during the coronavirus disease 2019 (COVID-19) pandemic may offer opportunities to more permanently expand remote access to medical nutrition therapy for CKD through legislative and regulatory changes.

Both patients and providers shared concerns about medical nutrition therapy cost. This perceived cost barrier may be due in part to the limited awareness of Medicare coverage for medical nutrition therapy. Although a substantial proportion of responding patients had Medicare coverage and most responding medical providers were primarily serving patients with Medicare, a large proportion of both groups were unsure about Medicare coverage for medical nutrition therapy. Consistent with previous surveys examining registered dietitian nutritionist knowledge of medical nutrition therapy billing and coding, even some registered dietitian nutritionists lacked awareness of the benefit. Strategies to increase awareness across patients and providers of Medicare no-cost share coverage for medical nutrition therapy should be considered. In addition, 40% of responding medical providers were nonphysicians, who cannot directly refer Medicare patients for medical nutrition therapy. Because advanced practice
providers are increasingly involved in both primary and specialty care.29,10 This may be an important barrier to address at a policy level.

For patients with other public and private insurance, potential interventions to increase medical nutrition therapy referrals and use may be more complicated. Public and private payers vary in their coverage for medical nutrition therapy, making it difficult to provide standard guidelines for referral, coding, and billing practices. The complexity associated with billing and coding for medical nutrition therapy across payers was indicated as one reason that about half the registered dietitian nutritionists and providers do not bill for medical nutrition therapy. Among practices that bill, there were reported issues with lack of reimbursement and low reimbursement; these issues have been reported in other surveys with registered dietitian nutritionists examining payment for medical nutrition therapy.27 The reported lack of reimbursement may be due to the differences in coding requirements across payers, and concerns around low reimbursement rates may lead practices to not spend time learning how to properly code for medical nutrition therapy across other public and private payers or submit claims.27

While issues related to inconsistent coverage, coding, and reimbursement for medical nutrition therapy can likely be best addressed at the policy and payer level, the Academy has resources available to help registered dietitian nutritionists and others navigate billing and coding challenges.11 With several toolkits for medical practices in development. In general, registered dietitian nutritionists need to increase their understanding of billing and coding issues related to medical nutrition therapy22 for advocacy purposes because despite a shift to value-based payments, fee-for-service reimbursement continues to drive service provision within US health systems.

In some cases, patient and practice characteristics made it more likely that a patient would receive or be referred for medical nutrition therapy, demonstrating opportunities to increase medical nutrition therapy access for CKD stages G1-G5 by better coordinating nutrition care for diabetes and CKD and increasing the co-location of registered dietitian nutritionists in medical practices. Additionally, opportunities exist to increase access to virtual and in-person self-management training for CKD stages G1-G5 through group classes, a model that has been successfully used in diabetes care.32-35 Given the large proportion of practices in this study reporting quality improvement capacity, quality improvement activities focused on guideline implementation could increase medical nutrition therapy referral. The Academy recently collaborated with the NKF’s Kidney Disease Outcomes Quality Initiative to update the clinical practice guidelines for nutrition in CKD and provide explicit recommendations related to medical nutrition therapy for CKD.12

| Medicare covers 3 hours of medical nutrition therapy for the first year that a patient with chronic kidney disease receives medical nutrition therapy. |    |    |    |
|---|---|---|---|
| Medical providers | 6 (20.0%) | 00 (0%) | 24 (80.0%) |
| RDNs | 41 (64.1%) | 2 (3.1%) | 21 (32.8%) |
| Patients | 39 (11.7%) | 10 (3.0%) | 285 (85.3%) |
| Medicare covers 2 hours of medical nutrition therapy for patients with chronic kidney disease in each subsequent year. |    |    |    |
| Medical providers | 7 (23.3%) | 1 (3.3%) | 22 (73.3%) |
| RDNs | 34 (53.1%) | 5 (7.8%) | 25 (39.1%) |
| Patients | 23 (6.9%) | 13 (3.9%) | 295 (89.1%) |
| Medicare covers additional hours of medical nutrition therapy for patients with chronic kidney disease with a second referral in the same year. |    |    |    |
| Medical providers | 4 (13.8%) | 1 (3.4%) | 23 (82.8%) |
| RDNs | 27 (42.2%) | 5 (7.8%) | 32 (50.0%) |
| Patients | 17 (5.1%) | 6 (1.8%) | 309 (93.1%) |

Note: The use of “non–diabetes dependent kidney disease” reflects the terminology used in the surveys, which was appropriate at the time. Since then, new KDIGO Nomenclature for Kidney Function and Disease have been developed and are used elsewhere in this article.

Abbreviations: CKD, chronic kidney disease; KDIGO, Kidney Disease: Improving Global Outcomes; RDN, registered dietitian nutritionist.

### Box 1. Potential Interventions That Could Be Tested to Assess Impact on Medical Nutrition Therapy Referrals, Patient Use of Medical Nutrition Therapy, and Patient Outcomes for CKD Stages G1-G5

- More widespread implementation of medical nutrition therapy delivered via telehealth for CKD stages G1-G5
- Better coordination of nutrition care for patients with diabetes and/or hypertension and CKD stages G1-G5
- Development and testing of a group class model for promoting self-management skills for patients with CKD stages G1-G5
- Promotion of patient-centered care and shared decision making around medical nutrition therapy referral
- Increased co-location of registered dietitian nutritionists in practices caring for patients with CKD stages G1-G5
- Strategies to improve provider and patient awareness of no-cost share Medicare coverage for medical nutrition therapy
- Policy changes to allow advanced practice providers to directly refer patients for medical nutrition therapy
- Policy- and payer-level actions to achieve consistent coverage and coding for medical nutrition therapy and enhanced payment for such services among other public and private payers
- Quality improvement activities to implement guidelines for nutrition care in CKD in medical practices
- Development and increased marketing of updated generalist registered dietitian nutritionist trainings on providing medical nutrition therapy for CKD

Abbreviation: CKD, chronic kidney disease.
Finally, concerns about the number of available registered dietitian nutritionists trained to provide medical nutrition therapy for patients with CKD stages G1-G5 may be legitimate. There have been efforts to address this issue over the last 10 years, with the National Kidney Disease Education Program of the National Institutes of Health developing a recently updated Chronic Kidney Disease Nutrition Management Training program to prepare generalist registered dietitian nutritionists to counsel patients with CKD, and the Academy promoting the training through its online Certificate of Training program. NKF also offers annual preconference workshops at the Spring Clinical Meetings for new and experienced renal registered dietitian nutritionists.

Box 1 lists several potential interventions at patient, provider, payer, and policy levels that could be tested to assess the impact on medical nutrition therapy referrals, patient use of medical nutrition therapy, and patient outcomes for CKD stages G1-G5.

A major strength of this study was the inclusion of patient perspectives in addition to provider perspectives. However, our inability to calculate accurate response rates for providers is a limitation in assessing generalizability. In particular, the overall number of providers that responded was small, and we may not have reached some medical providers or registered dietitian nutritionists providing care to patients with CKD stages G1-G5 through the recruitment channels that were used. The number of responding patients was also relatively small, and patients may not have been able to accurately self-report their current CKD grade. However, patients could likely accurately identify if they were receiving dialysis, which is perhaps most relevant to this study. There is also the potential for self-selection bias in that individuals with a strong interest in nutrition may have been more likely to respond to the survey, and for nonresponse bias. Additionally, there is the potential for social desirability bias, although this risk may have been reduced by assuring respondents of their anonymity. Because this was an anonymous survey, it was not possible to guarantee that respondents only completed the survey once.

In conclusion, there are significant opportunities to design and test interventions to address barriers and promote facilitators of medical nutrition therapy access for patients with CKD stages G1-G5.

SUPPLEMENTARY MATERIAL
Supplementary File (PDF)

Item S1: Complete survey questions for patients, registered dietitian nutritionists, and medical providers.

ARTICLE INFORMATION

Authors’ Full Names and Academic Degrees: Elizabeth Yakes Jimenez, PhD, RDN, LD, Kathryn Kelley, MPH, Marsha Schofield, MS, RD, LD, Deborah Brommage, MS, RDN, LDN, Alison Steiber, PhD, RDN, Jenica K. Abram, MPH, RDN, LDN, and Holly Kramer, MD, MPH.

Authors’ Affiliations: Nutrition Research Network, Research, International, and Scientific Affairs, Academy of Nutrition and Dietetics, Chicago, IL (EYJ, KK, AS, JKA); Departments of Pediatrics (EYJ) and Internal Medicine (EYJ) and College of Population Health (EYJ), University of New Mexico Health Sciences Center, Albuquerque, NM; Governance and Nutrition Services Coverage, Academy of Nutrition and Dietetics, Chicago, IL (MS); National Kidney Foundation, New York, NY (DB); and Division of Nephrology and Hypertension, Department of Public Health Sciences and Medicine, Loyola University Medical Center, Maywood, IL (HK).

Address for Correspondence: Elizabeth Yakes Jimenez, PhD, RDN, LD, Nutrition Research Network, Academy of Nutrition and Dietetics, Chicago, IL 60606. E-mail: bjimenez@eatright.org

Authors’ Contributions: Research idea and study design: EYJ, KK, DB, MS, AS, HK; data acquisition: KK, DB; data analysis: EYJ, KK; data interpretation: EYJ, KK, DB, MS, AS, JKA, HK. Each author contributed important intellectual content during manuscript drafting or revision and accepts accountability for the overall work by ensuring that questions pertaining to the accuracy or integrity of any portion of the work are appropriately investigated and resolved.

Support: The Academy provided staff support for the conduct of the study through the Nutrition Research Network.

Financial Disclosure: Dr Jimenez is on the Scientific Advisory Board for the NKF and has a contract with the Academy that involves overseeing a study funded by the Renal Dietitians Dietetic Practice Group and Relypsa through the Academy. Ms Kelley, Ms Schofield, Dr Steiber, and Ms Abram are directly employed by the Academy, the national professional organization for registered dietitian nutritionists, the primary providers of medical nutrition therapy. Ms Brommage is employed by the NKF, and Dr Kramer is the current president of the NKF.

Acknowledgements: We thank NKF staff members Kelly Collins and Jennifer Martin for their role in patient survey development; Jessica Joseph, Marissa Argentina, Sara Valencia, Kiley Thorton, and Cayla Guzewski for assistance with survey distribution; University of New Mexico dietetic interns Christina Fallows and Jessica Hammond for initial work on drafting the provider surveys; and Dr Jodi Holtrop from the University of Colorado for allowing us to review and adapt demographic and billing and coding questions from a survey developed as part of her Making Obesity Services and Treatment Work (MOST) Study.

Peer Review: Received May 16, 2020. Evaluated by 2 external peer reviewers, with direct editorial input from the Editor-in-Chief. Accepted in revised form September 7, 2020.

REFERENCES
1. Centers for Disease Control and Prevention. Chronic kidney disease in the United States, 2019. Accessed May 15, 2020, https://www.cdc.gov/kidneydisease/publications-resources/2019-national-facts.html.
2. US Renal Data System. Chapter 6: Medicare expenditures for CKD. Accessed May 15, 2020. https://www.usrds.org/2014/view/v1_06.aspx.
3. National Kidney Foundation. Estimated glomerular filtration rate (eGFR). Accessed May 15, 2020. https://www.kidney.org/atoz/content/gfr.
4. Wyd MLR, Lee CMY, Zhuo X, et al. Cost to government and society of chronic kidney disease stage 1-5: a national cohort study. Intern Med J. 2015;45(7):741-747.
5. US Renal Data System. Chapter 7: healthcare expenditures for persons with CKD. Accessed May 15, 2020. https://www.usrds.org/2018/view/v1_07.aspx.
Jimenez et al

Kidney Medicine

6. Kramer H, Yakes Jimenez E, Brommage D, et al. Medical nutrition therapy for patients with non-dialysis-dependent chronic kidney disease: barriers and solutions. J Acad Nutr Diet. 2018;118(10):1958-1965.

7. de Waal D, Heaslip E, Callas P. Medical nutrition therapy for chronic kidney disease improves biomarkers and slows time to dialysis. J Ren Nutr. 2016;26(1):1-9.

8. Institute of Medicine (US). Committee on Nutrition Services for Medicare Beneficiaries. The Role of Nutrition in Maintaining Health in the Nation’s Elderly: Evaluating Coverage of Nutrition Services for the Medicare Population. National Academy Press; 2000.

9. Slinin Y, Guo H, Gilbertson DT, et al. Prehemodialysis care by dietitians and first-year mortality after initiation of hemodialysis. Am J Kidney Dis. 2011;58(4):583-590.

10. Tuot DS, Plantinga LC, Hsu CY, et al. Chronic kidney disease awareness among individuals with clinical markers of kidney dysfunction. Clin J Am Soc Nephrol. 2011;6(8):1838-1844.

11. Academy of Nutrition and Dietetics Evidence Analysis Library. Recommendations summary CKD: medical nutrition therapy (non-dialysis) 2010. Accessed May 15, 2020, https://www.andeat.org/template.cfm?template=guide_summary&key=2407.

12. Ikizler TA, Burrowes J, Byham-Gray L, et al. KDOQI Nutrition in CKD Guideline Work Group. KDOQI clinical practice guideline for nutrition in CKD: 2020 update. Am J Kidney Dis. 2020;76(3)(suppl 1):S1-S107.

13. Tuot DS, Plantinga LC, Hsu CY, et al. Is awareness of chronic kidney disease associated with evidence-based guideline-concordant outcomes? Am J Nephrol. 2012;35(2):191-197.

14. Pafliti Z, Maridaki M, Giannaki CD, et al. Phosphorus nutritional knowledge among dialysis health care providers and patients: a multicenter observational study. Clin Nutr ESPEN. 2019;31:33-37.

15. Izquierdo RE, Knudson PE, Meyer S, et al. A comparison of diabetes education administered through telemedicine versus in person. Diabetes Care. 2003;26(4):1002-1007.

16. Galasso P, Amend A, Melkus GD, et al. Barriers to medical nutrition therapy in black women with type 2 diabetes mellitus. Diabetes Educ. 2005;31(5):719-725.

17. Strawbridge LM, Lloyd JT, Meadow A, et al. Use of Medicare’s Diabetes Self-Management Training Benefit. Health Educ Behav. 2015;42(4):530-538.

18. Powers MA, Bardsley J, Cypress M, et al. Diabetes self-management education and support in type 2 diabetes: a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. Clin Diabetes. 2016;34(2):70-80.

19. Vorderstrasse A, Shaw RJ, Blascovich J, et al. A theoretical framework for a virtual diabetes self-management community intervention. West J Nurs Res. 2014;36(9):1222-1237.

20. Artino AR, Durning SJ, Sklar DP. Guidelines for reporting survey-based research submitted to academic medicine. Acad Med. 2018;93(3):337-340.

21. Interdisciplinary Chronic Disease Collaboration. Chronic kidney disease (CKD) Clinical Pathway. Accessed May 15, 2020. www.ckdpathway.ca.

22. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap) – a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377-381.

23. National Conference of State Legislatures. Diabetes health coverage: state laws and programs. Accessed May 15, 2020. https://www.ncsl.org/research/health/diabetes-health-coverage-state-laws-and-programs.aspx.

24. U.S. Preventive Services Task Force. USPSTF A and B recommendations. Accessed May 15, 2020. https://www.uspreventiveservicestaskforce.org/uspstf/recommendation-topics/uspstf-and-b-recommendations.

25. Stiggelbout AM, Van der Weijden T, De Wit MP, et al. Shared decision making: really putting patients at the centre of healthcare. BMJ. 2012;344:e256.

26. Medicare.gov. Is my test, item, or service covered? Telehealth. Accessed May 15, 2020. https://www.medicare.gov/coverage/telehealth.

27. Jortberg BT, Parrott JS, Schofield M, et al. Trends in registered dietitian nutritionists’ knowledge and patterns of coding, billing, and payment. J Acad Nutr Diet. 2020;120(1):134-145.e3.

28. Kent PS, McCarthy MP, Burrowes JD, et al. Academy of Nutrition and Dietetics and National Kidney Foundation: revised 2014 standards of practice and standards of professional performance for registered dietitian nutritionists (competent, proficient, and expert) in nephrology nutrition. J Acad Nutr Diet. 2014;114(9):1448-1457.e45.

29. Sarzynski E, Barry H. Current evidence and controversies: advanced practice providers in healthcare. Am J Manag Care. 2019;25(8):366-368.

30. Martsolf GR, Barnes H, Richards MR, et al. Employment of advanced practice clinicians in physician practices. JAMA Intern Med. 2018;178(7):988-990.

31. Academy of Nutrition and Dietetics. Payment. Accessed May 15, 2020. https://www.eatrightpro.org/payment.

32. Deakin TA, McShane CE, Cade JE, et al. Group based training for self-management strategies in people with type 2 diabetes mellitus. Cochrane Database Syst Rev. 2005;2:CD003417.

33. Hwee J, Cauch-Dudek K, Victor JC, et al. Diabetes education through group classes leads to better care and outcomes than individual counselling in adults: a population-based cohort study. Can J Public Health. 2014;105(3):e192-e197.

34. Lorig K, Ritter PL, Turner RM, et al. Benefits of diabetes self-management for health plan members: a 6-month translation study. J Med Internet Res. 2016;18(6):e164.

35. Johnson CM, Mcllwain S, Gray O, et al. Creating a sustainable collaborative consumer health application for chronic disease self-management. J Biomed Inform. 2017;71:198-206.

36. Newman E, Zawislanki A. Addressing the growing need for chronic kidney disease medical nutrition therapy in primary care settings. Ren Nutr Forum. 2010;29(4):8-10.

37. Newman E, Enos D, Baron S, et al. Evaluation of an online chronic kidney disease nutrition management certificate of training program for registered dietitian nutritionists. Ren Nutr Forum. 2019;38(3):8-12.

38. National Kidney Foundation Spring Clinical Meetings. Council on Renal Nutrition. Strategies I: Essentials of Nutrition Practice for Chronic Kidney Disease and Strategies II: Advanced Practice in Renal Nutrition, Available at: https://education.kidney.org/content/topics-essentials-nutrition-practice-chronic-kidney-disease#group-tabs-node-course-default3. Accessed November 20, 2020.
What are barriers and facilitators to accessing medical nutrition therapy (MNT) for patients with CKD?

**Methods and Cohort**

**Cross Sectional Study**

- Patients with CKD G1-G5  
  n = 348
- Registered Dietitian Nutritionists (RDNs)  
  n = 66
- Medical providers  
  n = 30

**Anonymous Surveys (via email)**

- Measure knowledge, attitudes, experiences and practices regarding MNT
- Beliefs about barriers and facilitators
- Distributed via the NKF/Academy of Nutrition and Dietitians databases

**Findings**

**Perceived facilitators for MNT**

- Interest in MNT referral
- Perceptions of MNT preventing progression of CKD
- Positive perceptions of MNT

**Perceived barriers**

- Lack of renal RDNs
- Lack of insurance coverage
- Low reimbursement rates

**Conclusions:** There are significant opportunities to design and test interventions to address barriers and promote facilitators of MNT access for patients with CKD G1-G5.

**Reference:** Jimenez EY, Kelley K, Schonfeld M, et al. Medical nutrition therapy access in CKD: a cross-sectional survey of patients and providers. Kidney Medicine, 2020.

Visual abstract by Krishna K Agrawal, MD, DM, FACP

@agrawalkrls