

POCKET GUIDE TO

Chronic Kidney Disease and the Nutrition Care Process

SECOND EDITION

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CHAPTER 1

Chronic Kidney Disease, Evidence-Based Practice, and the Nutrition Care Process

This guide incorporates nutrition care for chronic kidney disease (CKD) with the steps of the Nutrition Care Process (NCP)—nutrition assessment, nutrition diagnosis, nutrition intervention, and nutrition monitoring and evaluation—as outlined in the *Abridged Nutrition Care Process Terminology (NCPT) Reference Manual: Standardized Terminology for the Nutrition Care Process*¹ and the online electronic Nutrition Care Process Terminology (eNCPT)² published by the Academy of Nutrition and Dietetics. The following are also incorporated in the text, tables, and boxes in this guide:

- the Kidney Disease Outcomes Quality Initiative (KDOQI) clinical practice guideline for nutrition in CKD (2020 update),³ which was developed by the Academy of Nutrition and Dietetics and the National Kidney Foundation (NKF)
- the Academy of Nutrition and Dietetics Evidence Analysis Library CKD practice guideline⁴
- recommendations from NKF-KDOQI publications on nutrition (2000)⁵ and diabetes and CKD⁷

- diabetes management recommendations from Kidney Disease Improving Global Outcomes (KDIGO), an international consortium of professional and patient-based organizations dedicated to kidney disease⁸
- recommendations from collaborative publications by NKF-KDOQI and KDIGO, specifically the guidelines on kidney transplant,^{9,10} CKD evaluation and management,^{11,12} anemia in CKD,¹³⁻¹⁶ blood pressure in CKD,¹⁷⁻²⁰ dyslipidemia management in CKD,²¹⁻²³ and CKD–mineral and bone disorder (CKD-MBD)²⁴⁻²⁷
- criteria for reimbursement and required documentation established by the US Centers for Medicare & Medicaid Services (CMS) Conditions for Coverage (CfC) for end-stage renal disease (ESRD) facilities and CMS Medicare Part B reimbursement criteria for medical nutrition therapy (MNT) for CKD and renal transplant²⁸⁻³¹
- key points from the American Society for Parenteral and Enteral Nutrition (ASPEN) clinical guidelines regarding nutrition support for acute and chronic renal failure in adults and ASPEN critical care guidelines for renal failure in adults^{32,33}

Findings and recommendations from these sources are integrated into the chapters to which they apply—Chapter 2: Nutrition Assessment, Chapter 3: Nutrition Diagnosis, Chapter 4: Nutrition Intervention Part 1—Planning the Nutrition Prescription, Chapter 5, Nutrition Intervention Part 2—Implementation, and Chapter 6: Nutrition Monitoring and Evaluation.

Medical Nutrition Therapy and the Nutrition Care Process in Chronic Kidney Disease

Stages of Chronic Kidney Disease

In 2002, NKF-KDOQI published a five-stage system for classifying CKD.³⁴ The *2012 KDIGO Clinical Practice Guidelines for the Evaluation*

and Management of CKD maintained the glomerular filtration rate (GFR) ranges for CKD stages 1 through 5 but split stage 3 into two categories: 3a and 3b (see Table 1.1).¹¹

TABLE 1.1 Stages of Chronic Kidney Disease¹¹

Stage	Glomerular filtration rate, mL/min/1.73 m ²
1	≥90 with kidney damage
2	60-89
3a	45-59
3b	30-44
4	15-29
5 and 5D (D = dialysis)	<15

Patients who are post transplant have varying levels of renal function. Their CKD stage should be determined based on their estimated glomerular filtration rate (eGFR), with MNT applied accordingly. The NKF and the American Society of Nephrology (ASN) appointed a task force to evaluate eGFR calculation methods. The goal of the collaboration was to determine a method of calculating eGFR without using the race variable, which was noted to be a societal interpretation and had no biological impact or relevance.³⁵ In 2021, the NKF/ASN task force³⁵ released three recommendations:

1. Immediately implement the “Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) creatinine equation refit without the race variable in all laboratories.”
2. Increase the use of cystatin C “to confirm estimated GFR in adults for clinical decision making.”
3. Focus on “new endogenous filtration markers and interventions to eliminate racial and ethnic disparities.”

Medical Nutrition Therapy and the Nutrition Care Process

MNT is an essential intervention to promote ideal health parameters. Patients with various health conditions and illnesses can improve their health and quality of life when learning to adhere to MNT recommendations. During MNT interventions, registered dietitian nutritionists (RDNs) educate and counsel patients on behavioral and lifestyle changes essential to encourage positive lifelong eating habits and health measures. MNT utilizes evidence-based nutrition to execute the steps of the NCP, as outlined in Box 1.1.³⁶

BOX 1.1 Steps of the Nutrition Care Process³⁶

The steps of the Nutrition Care Process follow the acronym **ADIME**:

- Perform a comprehensive nutrition assessment (**A**) and reassessment
- Determine the nutrition diagnosis (**D**)
- Plan and implement a nutrition intervention (**I**) using evidence-based nutrition practice guidelines
- Monitor (**M**) an individual's progress over subsequent visits with the registered dietitian nutritionist
- Evaluate (**E**) an individual's progress over subsequent visits with the registered dietitian nutritionist

This pocket guide focuses on the appropriate MNT for CKD stages 1 through 5D, including post transplantation. Acute kidney injury is not addressed. Practitioners should individualize MNT; the focus will depend on the patient's stage of CKD, medical history, and whether the encounter is an initial or follow-up visit. For example, MNT provided for a patient with a history of CKD stage 5 and diabetes who has elevated potassium and phosphorus levels but hemoglobin A1c (HbA1c) of 6.8% would be different from MNT for a patient with CKD stage 3a and normal potassium and phosphorus levels but HbA1c of 9%. Nutrition prescriptions and interventions are discussed further in Chapters 4 and 5, respectively.

Reimbursement Overview

Medicare Part B reimburses MNT provided by an RDN or other qualified nutrition professional, with a physician referral, for patients whose GFR is between 15 and 59 mL/min/1.73 m² (predialysis).^{29,37} Patients who are post-kidney transplant with any level of allograft function are covered by Medicare Part B for up to 3 years with a physician referral.²⁹ More information can be found on the CMS website (www.cms.gov; search for “MNT”). Table 1.2 provides a summary of Medicare Part B coverage for MNT for patients with CKD.^{29,30,37}

TABLE 1.2 Medicare Part B Reimbursement for Medical Nutrition Therapy for Patients With Chronic Kidney Disease^{29,30,37}

Timeline	Number of medical nutrition therapy units reimbursed ^a	Total hours per year
First year	12	3
Each subsequent year	8	2

^a For patients with an estimated glomerular filtration rate of 15 to 59 mL/min/1.73 m² and patients who are post transplant.

Based on medical necessity, additional hours of MNT may be covered if the treating physician orders them because of a change in the patient’s medical condition, diagnosis, or treatment regimen.^{29,30} For the first 3 years after transplant, MNT is a Medicare Part B benefit regardless of GFR with a physician referral.²⁹ After that time period, however, only those posttransplant patients with continuing CKD and a physician referral are eligible for Medicare Part B reimbursement for MNT.²⁹

Medicare Part B reimburses dialysis care when that care is delivered in a Medicare-approved outpatient dialysis facility, in the home, or via peritoneal dialysis (PD). A dietitian is required to “provide nutrition assessment, recommendations, counseling, and follow-up” to satisfy Medicare ESRD regulations.³⁸ Dialysis reimbursement is provided by the ESRD Prospective Payment System for up to three treatments per week,

unless additional treatments are medically needed. All dialysis care, including renal MNT, is “bundled” into one payment per treatment.³⁸

In 2021, the ESRD Treatment Choices model was introduced to promote patient selection of home dialysis and/or kidney transplant as a treatment modality and was rolled out in randomly selected geographic areas. With this new model, payment for MNT is rolled into payment for other dialysis care services.³⁸

As a result of the COVID-19 pandemic, CMS expanded approval for telehealth visits.^{39,40} With the end of the COVID-19 public health emergency, CMS has permanently authorized some types of telehealth care, but other telehealth flexibilities will expire December 31, 2024.⁴¹

Screening and Referral for Medical Nutrition Therapy Encounters

The 2010 Academy of Nutrition and Dietetics CKD guideline⁴ and the 2020 KDOQI/Academy of Nutrition and Dietetics guideline³ recommend the following practices for screening and referral of patients for care by an RDN or international equivalent:

- For adults with CKD stage 3 through 5D and post transplant, “it is reasonable to consider routine nutrition screening at least biannually with the intent of identifying those at risk of protein-energy wasting [PEW].”³
- MNT should be provided by the RDN for individuals with CKD because “MNT prevents and treats protein-energy malnutrition and mineral and electrolyte disorders and minimizes the impact of other comorbidities on the progression of kidney disease (eg, diabetes, obesity, hypertension, and disorders of lipid metabolism).”⁴
- MNT “should be initiated at diagnosis of CKD, in order to maintain adequate nutritional status, prevent disease progression, and delay renal replacement therapy (RRT) ... or transplant. MNT should be initiated at least 12 months prior to the anticipation of RRT.”⁴

- For adults with CKD stage 3 through 5D and post transplant, “it is reasonable that a registered dietitian nutritionist (RDN) or an international equivalent conduct a comprehensive nutrition assessment (included but not limited to appetite, history of dietary intake, biochemical data, anthropometric measurements, and nutrition focused physical findings) at least within the first 90 days of starting dialysis, annually, or when indicated by nutrition screening or provider referral.”³

The 2020 KDOQI/Academy of Nutrition and Dietetics work group³ was not able to suggest one nutrition screening tool as performing better than others when evaluating patients with PEW.

The 2020 KDOQI/Academy of Nutrition and Dietetics guideline used the GRADE (Grading of Recommendations Assessment, Development and Evaluation) work group grading system to evaluate the evidence around the recommendations (see Box 1.2).^{3,42} It is important to understand that not all recommendations are based on rigorous scientific evidence.

BOX 1.2 Strength of Recommendation and Quality of Evidence^{3,42}

<i>Strength of recommendation</i>		<i>Quality of evidence</i>	
Level	Meaning	Grade	Meaning
1	“We recommend”	A	High quality
		B	Moderate quality
2	“We suggest”	C	Low quality
		D	Very low quality

In addition to evaluating the clinical evidence, the 2020 KDOQI/Academy of Nutrition and Dietetics work group also determined the strength of the recommendations. A strong recommendation received a level 1 (“we recommend”) rating, meaning most individuals should receive the recommended course of action. A weak recommendation

received a level 2 (“we suggest”) rating, meaning that the action may be appropriate for some patients but the clinician should spend time helping patients make an individualized decision.³ **As appropriate, the strength of the recommendations and the grade of evidence are included throughout this guide (with the number and letter noted in parentheses in the respective statement).**

Medical Nutrition Therapy Based on Chronic Kidney Disease Stage

The RDN evaluates the stage of CKD and prioritizes the strategy for MNT based on nutrition issues that arise during that stage. In addition, the RDN assesses the patient’s level of interest in learning about the stage of CKD and the available social support and, on that basis, tailors MNT education and counseling. MNT for posttransplantation patients should be based on posttransplant renal function, which may decline over time.

Stage 3 and Post Transplantation

In clinical practice, evidence-based guidelines for MNT should be applied as appropriate based on a review of the patient’s medical history (eg, diabetes, hypertension, lipid disorders, or obesity), stage of CKD (including kidney transplant), nutritional status, and any mineral or electrolyte imbalances. The RDN should plan to coordinate the care of the patient with CKD with the interdisciplinary team to maximize the individual’s care.^{3,4,28}

Stage 4 and Post Transplantation

Because CKD stage 4 is defined by an eGFR of 15 to 29 mL/min/1.73 m², MNT for CKD and posttransplant patients with this stage is covered by Medicare Part B.^{11,29} As in earlier stages of CKD, MNT is based on a thorough assessment and includes coordination of care.

Stage 5 Not on Dialysis and Post Transplantation

CKD stage 5 not on dialysis is defined by an eGFR of less than 15 mL/min/1.73 m².¹¹ Medicare Part B provides MNT coverage only for

patients with an eGFR of 15 mL/min/1.73 m² or greater within stage 5 CKD or for posttransplant patients with this level of renal function.³⁷ As in earlier stages of CKD, MNT is based on a thorough assessment and includes coordination of care.

Stage 5D Hemodialysis and Peritoneal Dialysis

CKD stage 5D is defined by the initiation of renal replacement therapy (either maintenance hemodialysis or PD).¹⁷ Nutritional status should be evaluated using a combination of measures, such as protein and energy intake, body composition, and functional status.^{3,5}

CMS has released CfC for ESRD, which outlines the mandatory nutrition care plan and documentation to be completed for each patient on dialysis.²⁸ Box 1.3 summarizes the CfC and corresponding interpretive guidelines that relate to the four steps of the NCP. Interpretive guidelines are published by government agencies such as the CMS to guide surveyors, who are applying standards such as the CfC in the field.⁴³⁻⁴⁵

BOX 1.3 Medicare Conditions for Coverage Mandates Related to the Nutrition Care Process and Documentation⁴³⁻⁴⁵

Nutrition assessment

Condition for Coverage (CfC) §494.80 describes requirements for patient assessment.

Interpretive Guideline (IG) Tags V500 to V515 describe information to be included in assessments.

- IG Tag V509 is specific to nutrition.
- Topics discussed in other tags, such as factors associated with renal bone disease, also relate to nutrition and may be completely or partially addressed by the nephrology registered dietitian nutritionist (RDN) in accordance with accepted practice patterns at a given end-stage renal disease facility.

Nutrition diagnosis

Nutrition diagnosis is not mandated by the US Centers for Medicare & Medicaid Services but is a vital component of what the RDN does.

The nutrition diagnosis should be included in documentation of nutrition care.

Continued on next page

BOX 1.3 Medicare Conditions for Coverage Mandates Related to the Nutrition Care Process and Documentation (cont.)⁴³⁻⁴⁵**Nutrition intervention (including care plan) and nutrition monitoring and evaluation**

CfC § 494.90 states that an interdisciplinary team must develop and implement a comprehensive plan of care (POC) that describes services needed (ie, interventions) and outcomes (ie, monitoring and evaluation step of the Nutrition Care Process).

IG Tag 545 sets expectations for an outcome-oriented POC related to nutritional status.

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1. Academy of Nutrition and Dietetics. *Abridged Nutrition Care Process Terminology (NCPT) Reference Manual: Standardized Terminology for the Nutrition Care Process*. Academy of Nutrition and Dietetics; 2018.
2. Academy of Nutrition and Dietetics. Electronic Nutrition Care Process Terminology (eNCPT). Accessed November 29, 2022. www.ncpro.org
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Case Study

Nutrition Care Process

Step 1: Assessment

The following case study will build on the steps of the Nutrition Care Process throughout the remaining chapters of this guide. Chapter 2 presents the details necessary for nutrition assessment, Chapter 3 will list the nutrition diagnosis statements, Chapters 4 and 5 will outline the nutrition intervention, and Chapter 6 will conclude with monitoring recommendations. The details of the case study carry over from one chapter to the next, with the information pertinent to each specific chapter highlighted for clarity.

A 56-year-old female individual with CKD stage 5D on peritoneal dialysis is admitted to the hospital.

Nutrition Assessment

Food/Nutrition-Related History

Food intake

Patient consumes traditional Cambodian foods and follows traditional Cambodian meal patterns, including rice, stir-fried vegetables, and small amounts of fish, poultry, and beef. Uses fish sauce frequently. Has been consuming increased amounts of cola soft drinks to ease nausea.

Medications

HMG-CoA reductase inhibitor (statin), renal multivitamin, calcium carbonate and sevelamer with meals, calcitriol, ferrous sulfate, insulin aspart with meals, isoniazid, vitamin B6, and lansoprazole. Has missed a few days of taking medications because of current condition.

Food and nutrition knowledge/skill

Family is aware of low phosphorus and low potassium foods; is very involved.

Physical activity

Sedentary

Anthropometric Measurements

Body Composition, Growth, and Weight History

Height

150 cm (59 in)

Admit weight

74.5 kg (164 lb)

Estimated dry weight (EDW)

72 kg (has been stable)

BMI (using EDW)

32

Frame size

Medium

Ideal body weight (IBW)

62 kg; 116% IBW

Biochemical Data, Medical Tests, and Procedures

Electrolyte and renal profile

See laboratory data table.

Nutritional anemia profile

See laboratory data table.

Urine output

500 mL/24 h

Laboratory Data for Nutrition Assessment of Patient^a

Laboratory test	Reference range	Patient result
Potassium, mmol/L	Normal: 3.4-5 Peritoneal dialysis (PD) ^a : 3.5-5.5	5.4
Blood urea nitrogen, mg/dL	Normal: 6-20 PD: >60	58
Creatinine, mg/dL	Normal: 0.7-1.3 PD: not defined	11
Glucose, mg/dL	Normal (fasting): 60-99	92
Calcium, mg/dL	Normal: 8.6-10.2	8.8
Phosphorus, mg/dL	Normal: 2.4-4.7 PD: 3.5-5.5	5.7
Albumin, g/dL	Normal: 3.5-4.7 PD: >3.5	1.6
Hemoglobin, g/dL	Normal: 13.5-17.5 PD: 10-12	9
Capillary blood glucose, mg/dL	Normal: <150	120-250
Sodium, mmol/L	Normal: 134-143	129

^a Reference range for patients on peritoneal dialysis.

Nutrition Focused Physical Findings

- Overall appearance: abrasions on arms and neck from scratching
- Obese with central adiposity
- Bilateral ankle edema and edema of eyelid
- Diarrhea, nausea, and vomiting
- Pale conjunctiva
- Koilonychia (spoon-shaped nails)

Patient History

Personal data: Patient is 56-year-old female individual, does not speak English; children are fluent in English and are very involved and supportive.

Patient or family nutrition-oriented medical/health history: ESRD due to hypertension. History includes type 2 diabetes. Admitted to the hospital with peritonitis, pain, nausea, vomiting, and fever. Third episode of peritonitis in 2 months. Latent tuberculosis.

Treatment/therapy: Peritoneal dialysis with five exchanges per day, each 2 L 2.5% dextrose. Type 2 diabetes mellitus managed with insulin; capillary blood glucose usually less than 250 mg/dL.

References

1. Academy of Nutrition and Dietetics. *Abridged Nutrition Care Process Terminology (NCPT) Reference Manual: Standardized Terminology for the Nutrition Care Process*. Academy of Nutrition and Dietetics; 2018.