

# HEALING HANDS



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## Kidney Disease: Prevention and Early Detection of a Silent Killer

*Kidney disease is one piece of a rampant triad undermining health around the world and in the United States. It is closely interrelated with hypertension and diabetes and like them is a silent disease, often remaining symptomless until there is massive damage. The following articles will review relevant information about chronic kidney disease (CKD) and end-stage renal disease (ESRD), how to document client disability, and the role of medical respite in supporting clients affected by these conditions.*

Slow and steady, it often takes 10 to 20 years before an individual develops symptoms of CKD and then it may be too late to deter progression to end-stage renal disease and dialysis. The good news: primary care practitioners can make a huge difference in client care and outcomes by finding CKD early, when its progression still can be delayed. Research has provided the groundwork; the documented association between hypertension, diabetes, and kidney disease draws attention to high-risk groups that need closer follow-up.<sup>1-5</sup> Other conditions that damage the kidney include:<sup>1,6,7</sup>

- Vascular disease of arteries (bilateral renal artery stenosis)
- Congenital kidney disease (such as polycystic kidney disease, Alport syndrome)
- Interstitial nephritis (inflammation associated with medications)
- Glomerulonephritis (associated with HIV, hepatitis B or C, autoimmune or genetic disorders, heroin)
- Kidney obstruction (stones, cervical cancer, prostate tumors or benign prostatic hyperplasia)
- Multiple myeloma (cancer of the plasma cells)
- Reflux nephropathy (urine backflow from the bladder)
- Recurrent bladder infections
- Trauma

"I rediscover each day that the heart of care is in

relationships—especially the element of building trust—through my work with homeless people as an internist at Unity Health Care and the Center for Creative Non-Violence (CCNV) shelter in Washington, D.C.," says **Anne Cardile, MD**, medical director of CCNV's Federal City Shelter. "Many of our clients suffer from chronic disease that is often made worse by delayed treatment. Once we identify HIV, diabetes, hypertension, or CKD, we can begin establishing a relationship with patients that empowers them to take control of these

diseases with medication and lifestyle adjustments. We work in partnership and that knowledge gives our clients hope. As our clients do their part—taking their medications and following up in the clinic—we provide the support, education, and care that helps them meet daily challenges."

**HOW KIDNEYS WORK** Humans have two kidneys—bean-shaped organs approximately four-to-five-inches long—located deep within the mid-trunk on each side of the spine and protected by the lower rib cage and strong muscles of the back. Inside each kidney, a highly sophisticated network of blood vessels and capillaries, glomeruli, and nephron tubules cleanse about 200 quarts of blood a day, sifting out as much as two quarts of waste and water, which are eventually excreted as urine. The approximately one million glomeruli (filters) in each kidney are susceptible to infection, inflammation, and toxins introduced by viruses, bacteria, proteins, and chemicals that arrive via circulating blood.<sup>6,7</sup>

In addition, kidneys regulate body water and other chemicals (e.g.,

sodium, potassium, phosphorous, calcium), and release hormones to help the body control blood pressure, make red blood cells, and promote strong bones. Damage to kidneys from CKD decreases their ability to accomplish these

“Homelessness increases the already formidable challenge of providing dialysis patients with adequate medical and nursing care. Hygiene, maintenance of medication regimens, dietary and fluid restrictions, emotional support, transportation, and compliance with treatment schedules are all made more difficult and complex by homelessness. As a result, these patients are more likely to experience ESRD complications, increased morbidity, and death. To compensate for the added burden imposed on their health by their social situation . . . and to bring about acceptable health outcomes for this population, a flexible, high functioning team is necessary.”

—Jean L. Holley and colleagues, *Managing Homeless Dialysis Patients*<sup>8</sup>

tasks. As CKD worsens, body wastes build up in the blood system and patients may experience anemia, poor nutritional health, nerve damage, cardiovascular disease (CVD), and kidney failure (ESRD).<sup>1,6</sup>

When symptoms emerge, they are similar to those of many illnesses making identification of CKD difficult. Signs may include loss of energy, dry skin and generalized itching, edema of hands and feet, increased urination, trouble concentrating, and numbness.

**EPIDEMIOLOGY** The prevalence of CKD is estimated to be 26.3 million in the United States.<sup>9,10</sup> In 2002, due to increased incidence and prevalence of kidney failure, the National Kidney Foundation Kidney Disease Outcomes Quality Initiative (KDOQI) published clinical practice guidelines defining CKD and classifying stages of disease progression.<sup>1</sup>

The National Kidney Foundation (NKF) defines CKD as follows: Kidney damage or glomerular filtration rate (GFR) less than 60 mL/minute/1.73m<sup>2</sup> for three or more months, with or without kidney damage.<sup>1,10,11</sup>

Kidney damage is defined as structural or functional abnormalities of the kidney, manifested by pathologic abnormalities or markers of kidney damage, including abnormalities in the composition of the blood or urine (proteinuria) or abnormalities in imaging tests.<sup>1,11,12</sup>

Because early detection and treatment may prevent or delay disease progression, the KDOQI-formulated guidelines closely associate actions with the staging classification (see Table 1). This classification system has engendered dramatic increases in awareness and treatment of CKD. Clinicians within the KDOQI and the Kidney Disease: Improving Global Outcomes continue work to refine the stages and guidelines based on emerging evidence from a growing CKD database.<sup>13</sup>

The United States Renal Data System (USRDS) Annual Data Report documents incidence and prevalence of CKD, ESRD, and other co-occurring diseases.<sup>14</sup> Using the annual National Health and Nutrition Examination Survey (NHANES)<sup>9</sup> and other research that includes validated measures of GFR,<sup>14</sup> the 2009 report showed that the proportion of U.S. adults with low, intermediate, and high GFR levels remained stable. Analysis of prevalence of comorbidities (e.g., diabetes, hypertension, CVD, chronic obstructive pulmonary disease, hepatitis C, cancer, connective

tissue disease, and hip fracture) demonstrated a clear trend to higher prevalence associated with advanced CKD stage, especially in CKD stages 4 and 5.<sup>9,14</sup>

The USRDS is more precise when discussing ESRD. In 2007, the incidence rate of ESRD (new cases accepted for treatment) was 111,000. Demographic analysis showed that of those, 66,629 were over 60 years of age, 52,978 fell into the highest racial and ethnic risk groups (African American, Native American, Asian, Hispanic), and the two largest related comorbidities were diabetes (48,871) and hypertension (30,657). ESRD prevalence rose 2 percent over 2006 to 527,000.<sup>14</sup> Statistics for homeless populations are not reported, but these trends can help identify clients who are at greater risk.

In terms of economic impact, the numbers are quite significant. The per person per year overall cost of hemodialysis in 2007 was \$73,000; the costs for Medicare patients with CKD reached \$57.5 billion, while Medicare expenditures for patients with diabetes reached \$80.5 billion (CKD patients accounted for 39 percent of these costs).<sup>14</sup>

**PROVIDING SOLUTIONS** Education plays a key role in reducing the morbidity and mortality caused by kidney disease and its complications. Fortunately, a variety of educational materials are available:

- The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) offers online programs, including Tools and Resources for Health Professionals<sup>7</sup>
- A comprehensive NKF curriculum, *Your Treatment, Your Choice*, designed to help patients make informed treatment choices, is free to qualified professionals in downloadable format on a CD-ROM in English and Spanish<sup>1</sup>
- Local NKF affiliates offer free, primary care provider CME programs such as the National Capital Area's Kidneys for Life<sup>1</sup>

**TABLE 1. NKF Classifications of CKD<sup>1,6,10,11,12</sup>**

Stage	Definition	Symptoms	Protein Intake	Action
Unstaged	At increased risk of CKD (GFR* >60 mL/minute/1.73 m <sup>2</sup> )	None	0.75 g/kg/day (RDA†)	Screening
Stage 1	Kidney damage with normal or elevated GFR (≥90 mL/minute/1.73 m <sup>2</sup> )	None	0.75 g/kg/day (RDA)	Diagnosis and treatment; treatment of comorbid conditions; interventions to slow disease progression; reduction of risk factors for CVD
Stage 2	Kidney damage with mildly decreased GFR (60–89 mL/minute/1.73 m <sup>2</sup> )	None	0.75 g/kg/day (RDA)	Estimation of disease progression
Stage 3	Moderately decreased GFR (30–59 mL/minute/1.73 m <sup>2</sup> ); halfway to kidney failure	None	0.75 g/kg/day (RDA)	Evaluation and treatment of disease complications
Stage 4	Severely decreased GFR (15–29 mL/minute/1.73 m <sup>2</sup> )	Possible edema, nausea	0.60 g/kg/day	Preparation for kidney replacement therapy (dialysis, transplantation)
Stage 5	Kidney failure (GFR <15 mL/minute/1.73 m <sup>2</sup> )	Possible edema, nausea, or shortness of breath	0.60 g/kg/day; patients clinically stable on maintenance hemodialysis 1.2 g/kg body weight/day (at least 50 percent high biological value)	Kidney replacement therapy if uremia (an excess of urea or other nitrogenous compounds in the blood; azotemia) is present

\*GFR (glomerular filtration rate) measures the level of kidney function (ability to filter blood) and determines stage of kidney disease. The Modification of Diet in Renal Disease (MDRD) formula—which includes serum creatinine concentration, age, sex, race, and body size—is used to estimate GFR. GFR calculators may be accessed on the NKF website at [www.kidney.org/professionals/KDOQI/gfr\\_calculator.cfm](http://www.kidney.org/professionals/KDOQI/gfr_calculator.cfm)

†RDA (U.S. recommended dietary allowance) for normal adults

"In Washington, we have the highest kidney disease prevalence in the nation," says **Kamaljit K. Sethi, MD**, a nephrologist who volunteers with Unity Health Care. "Recently, I heard a health department presentation announcing a ten-point plan for better health and was struck by the missing piece: education. We have a gap in understanding and all providers, community agencies, and even elementary schools need to be involved in addressing it. People know that diabetes is associated with high glucose—sugar—levels in the blood and that it can result in blindness or loss of a limb, but they don't comprehend its relationship to hypertension and chronic kidney disease and how untreated those three can lead to kidney failure and dialysis."

**PATHWAYS TO CARE** When assessing for kidney disease, the clinician's starting point is a thorough client and family health history followed by administration of three simple tests:<sup>1,7,11,12</sup>

- Check the client's blood pressure
- Measure serum creatinine levels in the client's blood using the MDRD GFR calculator (Table 1)
- Measure the client's urine albumin levels (persistent protein can indicate kidney disease)

"Testing for kidney disease is easy. It includes three steps: a blood test, a urine test, and a blood pressure reading. I always advise clinicians to follow life insurers' lead; for years a urine test has been part of application screening processes because protein in the urine is a marker of decreased longevity." Sethi adds: "Our homeless clients have diabetes, high blood pressure, HIV, and often abuse drugs associated with hepatitis B and C, and all of these comorbidities lead to kidney disease. Now as I read the referrals and test reports from Unity compared to when I began years ago, I am gratified to see our clinicians have learned to order the needed tests on initial patient visits."

Kidney disease can be effectively treated when diagnosed early. "But it's essential for providers to help clients make the connections and become committed to their treatment regimen. Clients need to know that the interrelationship between CKD and hypertension is relentless—you may not feel sick—yet left untreated, CKD triggers higher blood pressure and, in turn, high blood pressure harms the kidneys," says **Jennifer Weil, MD**, a researcher at the NIDDK in Phoenix, Arizona. "Elevated blood sugar present in diabetes doesn't exist in a vacuum. When too much sugar circulates in the blood stream it cannot move into cells and ends up binding to proteins in vital organs. While clients may be aware that diabetes can raise blood pressure and cause blindness, they may not realize that it's hard on the heart, kidneys, and nerves too."

When treating CKD, the goal is to slow progression while preventing CVD complications and providing optimal patient care:<sup>2,6</sup>

- Aim for hemoglobin A1C level of 7.0 percent in clients with diabetes (given recent evidence that A1C lower than 6.5 percent may not improve outcomes, aiming for 7.0 to 7.5 percent may be reasonable)
- Measure blood pressure at every visit and achieve levels of less than 130/80 mm Hg for those with hypertension
- Preserve renal function and reduce proteinuria with angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs); adverse effects of ACE inhibitors and ARBs include fetal malformations

- Use urine microalbuminuria (check ACE inhibitor or ARB action)
- Manage electrolyte disturbances, anemia, malnutrition, and hyperparathyroidism
- Refer to a nephrologist as CKD progresses for assistance in management and preparation for renal replacement therapy (RRT) before GFR falls below 29 mL/minute/1.73 m<sup>2</sup>
- Encourage protein consumption based on RDA (Table 1), low sodium, and later low potassium and low phosphorus dietary therapy as practicable
- Check cholesterol, especially low-density lipoprotein, to prevent CVD

"For patients who have kidney disease from diabetes, be sure to test A1C levels quarterly, and perform monofilament sensory tests and dilated retinal exams annually." Weil continues: "If the cause of kidney disease is elusive (i.e., there is no diabetes or hypertension) then other blood tests may reveal the cause of CKD. Anti-nuclear antibody (ANA), C3 and C4 complement levels, anti-neutrophilic cytoplasmic antibodies (ANCA-C and ANCA-P), anti-glomerular basement membrane antibody (Anti-GBM), cryoglobulins, serum protein electrophoresis with immunofixation, kappa-lambda light chain ratio, hepatitis B surface antigen, hepatitis C antibody, HIV screening, and renal ultrasound are all useful tests in patients who have no evident reason for CKD. Often a biopsy will also be necessary."

**RENAL REPLACEMENT THERAPY** When CKD progresses to kidney failure, additional clinical support is required to prepare patients for RRT. Planning begins at stage 4 because of unpredictable disease progression and delays in scheduling client education, procedures, and evaluations of donor and patient if transplantation is chosen.

Clients experiencing kidney failure need dialysis or kidney transplantation to live. Provider and client must consider benefits of fluid control and solute clearance achieved through dialysis versus physical and psychosocial risks of therapy because patient response to ESRD and treatment varies. Clinicians must also consider client ability and willingness to adhere to medical and nutritional regimens that attend treatment.<sup>1,6,8,15</sup>

There are two avenues to renal replacement therapy: (1) peritoneal dialysis (PD) or hemodialysis (HD), and (2) kidney transplantation. PD can be done at home offering flexibility of location and time. It involves the insertion of dialysate fluid into the peritoneum via catheter access. The dialysate draws waste and extra fluid out of the blood stream to be drained out of the body (exchanged) through the catheter. The client learns to do the exchanges him or herself on a daily basis. HD uses a machine to cleanse waste and extra fluids from a client's blood. Blood travels via a tube from the body to a dialyzer (the machine's filter), is filtered, and returned to the body via a second tube. It requires client vascular access, which is achieved through a fistula, graft, or direct catheter.

An arteriovenous fistula (AVF) requires a minor surgical procedure to connect an artery and vein in the client's arm. It lasts longer than other types of access and is less likely to become infected or subject to blood clots. Healing time for an AVF takes several months to establish strong access necessary to support insertion of two catheters that remove and return the filtered blood.

HD treatments occur three-to-five times per week and last approximately four hours. Transportation is required to treatment locations at a hospital or dialysis center. Specially mandated dialysis teams include a physician, nurse, technician, dietician, and social worker. Clients spend treatment time in a reclining chair, reading or talking with staff or other patients. At least initially, they may be fatigued after each session.

Providers within ESRD communities offer their clients “a unique, close-knit, social, medical community . . . where boundaries [to friendship] are sometimes blurred.”<sup>16</sup> A client on HD can spend up to 20 hours a week in treatment, creating opportunities for ongoing support. Psychosocial factors contribute to behavioral compliance of HD patients as demonstrated in correlations between client perception that providers care about them and improved client attendance at dialysis and increased dietary compliance.<sup>17</sup>

Indeed, HD complicates clients' lives by restricting their daily schedules, diet, energy level, and changing interpersonal relationships with spouse, family, employer, social network, and health care providers. Individuals with ESRD in tenuous financial circumstances and undergoing dialysis are at risk for homelessness or unstable housing situations because requirements to balance dialysis treatment, medical attention, medications, and nutrition supplant other concerns.<sup>16</sup>

**NUTRITIONAL IMPACT** Nutritional care for CKD and ESRD is complex and crucial. “Most Americans eat more protein than the RDA levels (Table 1), which makes it difficult to understand the transition from RDA protein to lower protein and then higher protein as disease progresses and dialysis begins. The MDRD study was inconclusive regarding the benefit of protein restriction on kidney disease progression,<sup>1</sup> but there was no evidence of a beneficial effect for dietary protein intake higher than RDA. In the absence of evidence of malnutrition, RDA appears reasonable for patients with CKD stages 1 through 3,” Weil says. “KDOQI guidelines recommend consideration of protein intake of 0.60 g/kg/day for CKD stages 4 and 5 (GFR <25 mL/minute). Guidelines for those on dialysis, however, support a high protein diet double that of

those with CKD but not yet on dialysis. The reason is that dialysis cleanses nutrients such as amino acids from the blood along with wastes.”

Homeless clients dependent on shelters and soup kitchens for daily meals balance thankfulness for food to assuage hunger with the necessity for a diet that does not worsen disease control. Potentially, hyperkalemia (high potassium in the blood) is the most dangerous nutritional complication because foods high in potassium such as bananas, melons, oranges, potatoes, and tomatoes are plentiful at food programs. It is rare for a homeless dialysis patient's meal to include eight ounces of meat, evidence that their diets lack sufficient high-quality protein.<sup>8</sup> In addition to CKD, many have comorbid diabetes, hypertension, or CVD, which increase their dietary challenges.

Some HD patients struggle to maintain high levels of protein, requiring special nutritional supports (food supplements, tube feeding, intravenous nutrition).<sup>18</sup> Increased protein promotes energy and builds muscles and tissue, but also increases phosphorus, hydrogen ions, cholesterol, and dietary fats, thereby heightening the complexity of keeping body fluids in balance. Adjustments in therapy may be required (e.g., dialysis dose, phosphate binders, bicarbonate supplementation, and cholesterol management).<sup>18,15</sup>

**DOCUMENTING DISABILITY** Health care clinicians working with homeless clients need to play an active role in documenting their patients' medical impairments. This does not mean that they will pass judgment on whether their client is disabled but rather they will provide evidence in support of a disability claim. To accomplish such documentation efficiently and effectively, providers need to be familiar with the Social Security Administration (SSA) process of applying for disability benefits and requirements for providing supportive evidence.

Important to CKD, the Social Security Amendments of 1972 established the Medicare ESRD Program. Today, Medicare covers people of any age with permanent kidney failure requiring dialysis or a kidney transplant. Medicare Part A (hospital insurance) helps cover inpatient care in hospitals and skilled nursing facilities, hospice care, and home health care services. This coverage is free if the patient or his or her spouse paid Medicare taxes while working. To receive full benefits, however, recipients must pay monthly premiums for Medicare Part B (medical insurance), which helps cover doctors' services, outpatient care, home health care, and some preventive services to help maintain health.<sup>18</sup> Medicaid and veterans' medical benefits can be additional sources of financial support.

This federal program can benefit homeless clients with ESRD substantially. There are associated costs, however, for Part B coverage and for care, and Medicare does not cover shelter and food. In addition, it does nothing to cover costs of CKD before ESRD-related dialysis or transplant. Thus, clients with CKD and ESRD may be best served by successful application to SSA for disability benefits through the Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI) programs.<sup>19</sup>

**SUPPORTING HOMELESS CLIENTS** “Every December at our Remembrance Gathering, I mention the folks in our community who have died earlier than they should because of renal disease,” says **Janelle Goetcheus, MD**, chief medical officer and executive vice-

#### Documenting Disability Training for Medical Providers

This online course teaches clinicians how to expedite federal benefits for clients who are entitled to Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI).

The training emphasizes the importance of clinician support for homeless individuals' disability claims and how to relate to others involved in the process. Four experts talk participants through the documentation process:

- Barry D. Zevin, MD, San Francisco Department of Public Health  
Tom Waddell Health Center
- James J. O'Connell, MD, Boston Healthcare for the Homeless Program
- Sarah Anderson, JD, Greater Boston Legal Services
- Pat Post, MPA, National Health Care for the Homeless Council

The training is available through the National Health Care for the Homeless Council website at no charge, and you may enroll at any time and complete the course at your own pace. To enroll, go to [www.nhchc.org/DocDisability/DocDisOnline.html](http://www.nhchc.org/DocDisability/DocDisOnline.html).

president for medical affairs at Unity Health Care in Washington, D.C. “Renal disease is especially difficult because untreated it develops into renal failure.

“We fairly regularly have dialysis patients receiving medical respite care

at Christ House,” Goetcheus continues. “In fact, we’ve just helped our first formerly homeless patient through a kidney transplant, which is rare for folks without housing because they have difficulty controlling their lives and medications and nutrition well enough to qualify. We’ve certainly celebrated with him!” ■

## Respite Care: An Essential Support for ESRD

**M**edical respite care provides acute and post-acute medical care for homeless people too ill or frail to recover from a physical illness or injury on the streets, but not sick enough to be in a hospital.<sup>20</sup>

**Alice Y. Wong, RN, CNS**, nurse manager of the Medical Respite Program, San Francisco Department of Public Health, understands the need. “We are the only medical respite provider in the city and the need for services is great. Our 45 beds—18 for women, 27 for men—are always full. The usual length of stay is 30 days, but some clients have passed 80 days now,” Wong says. “When we hold patients for housing, our numbers back up. It’s simple when patients have acute health care needs and no home, they need a place to stay until they are better, stronger. While they’re here, they can access good case management.

“Our ESRD clients may have come for fistula placement, and now are getting used to the three-day-a-week dialysis schedule and managing their new medications. We try to get them on a path to housing. Some refuse to go. In San Francisco, most supportive housing requires a third-party payee to oversee SSI checks and make sure the 30 percent of income is paid for rent.”

“The Center for Respite Care has served at least 24 ESRD patients over time,” says **Bob Donovan, MD**, medical director, Cincinnati Health Network, Inc. “It’s important because often homelessness interferes with their ability

to access dialysis. Once dialysis has begun, patients need help adjusting to the rigors of the treatment schedule, complex medication regimens, and restricted nutrition guidelines.

“We view our mission as helping folks become independent. One piece of that initiative has always been providing quality primary health care—it gives them hope. After all, they want to be well again, and to accomplish that endeavor, we are on their side.”

**Terry Mack** will turn 55 in August but he depends on the staff at the Center for Respite Care right now. “About a year ago, I had a motorcycle accident and while I was in the hospital they told me I had diabetes, high blood pressure, and kidney disease,” Mack says. “Now I have kidney failure and they’ve put the tubes in. This dialysis has turned my life upside down. I didn’t understand how the treatments would make me so tired for a whole day afterwards. It sure hasn’t stopped the neuropathy in my feet yet—I can’t feel my feet or legs. But staying at respite is helping me to settle down; there’s help getting to treatments, good food, and I can sleep in the same bed every night.”

“Helping our clients address new and restrictive nutritional guidelines and medication regimens is important to their successful transition to independent living and we do try very hard to discharge them to a stable living situation,” says **Mildred Williams, LPN**, nurse manager at Cincinnati’s Center for Respite Care. “Teaching



Terry Mack receiving treatment at a dialysis center in Cincinnati (photo courtesy of DaVita Dialysis Center)

clients to avoid potassium is one of our challenges. We are fortunate to have a dietitian who will prepare special meals, but for patients with co-occurring diabetes, hypertension, and ESRD, it’s quite a challenge.”

Vulnerability to illness and trauma faced by homeless individuals is responsible for increased morbidity and mortality. Health care environments where many services and procedures are provided on an outpatient model that relies on patients returning home to recuperate further complicate the lives of those experiencing homelessness. “Homeless people are often discharged with prescriptions for medication they cannot afford and instructions for self-care—such as resting, drinking fluids, [and keeping wounds clean and dry]—that cannot be followed.”<sup>21</sup> Medical respite care provides a temporary answer to such needs. ■

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