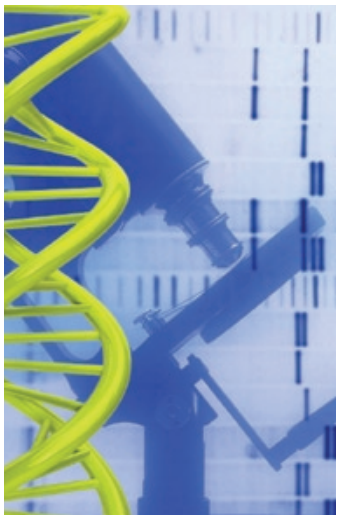
News and Resources from the National Institutes of Health

Kidney Disease Research Updates

National Kidney and Urologic Diseases Information Clearinghouse Fall 2008

Newly Identified Gene Variations Account for Increased Burden of Kidney Disease among African Americans

For the first time, researchers have identified variations in a single gene that are strongly associated with kidney diseases disproportionately affecting African Americans. The work was conducted by researchers at the National Institutes of Health (NIH) and by NIH-funded investigators at the Johns Hopkins University. The findings were published in the October issue of *Nature Genetics*.



Researchers studied nondiabetic kidney diseases that can lead to chronic kidney disease (CKD) and, in severe cases, kidney failure requiring long-term dialysis or a kidney transplant. One of these diseases, focal segmental glomerulosclerosis (FSGS), is a condition that leads to kidney failure over a period of about 10 years in more than half of those with the disease.

CKD is caused by many different diseases and conditions and affects 26 million Americans. More than 106,000 individuals develop kidney failure and more than 485,000 receive dialysis or a transplant in the United States each year.

Using a type of genome association that relies on differences in the frequency of gene variants between populations, NIH researchers identified several variations in the *MYH9* gene as major contributors to excess risk of kidney disease among African Americans. NIH researchers shared their discovery with Johns Hopkins scientists, who replicated the findings in participants from earlier kidney disease studies.

Both research teams found statistically significant associations of *MYH9* variants with FSGS, HIV-associated FSGS, and all nondiabetic kidney failure. They also found these variants were much more frequent among people of African ancestry than among Caucasians. The increased risk among African Americans with these variants

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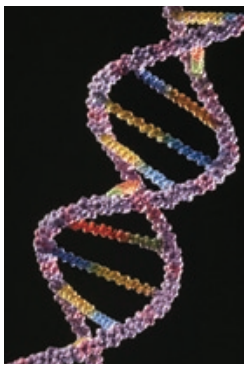
NIDDK
National Institute of Diabetes and Digestive and Kidney Diseases



"We hope this finding will lead to personalized medical therapy that will reduce the burden of chronic kidney disease."

Jeffrey B. Kopp, M.D.

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is more than 300 percent for FSGS, more than 500 percent for HIV-associated FSGS, and more than 100 percent for all nondiabetic kidney failure. Sixty percent of African Americans carry the risk variants in contrast to 4 percent of Caucasians.

Though FSGS affects African Americans more than Caucasians, the rate of progression to kidney failure is believed to be the same for both populations. FSGS associated with HIV infection is almost exclusively found in individuals of African descent and, without treatment, progresses more rapidly to kidney failure compared with other forms of kidney disease. FSGS often affects adolescents and young adults as well as older individuals.

"These two breakthrough genomic studies on kidney disease illustrate the importance of collaborations between scientists at the NIH and NIH-funded investigators at Johns Hopkins," said NIH Director Elias A. Zerhouni, M.D. "This type of Government-academic collaboration moves translational research forward and provides the knowledge base for developing new therapies for these chronic health disorders."

In the NIH study, researchers scanned the genome of 190 African Americans known to have FSGS, including the form associated with HIV infection, and 222 who did not have FSGS and replicated these findings in additional cases. Johns Hopkins researchers, members of the Family Investigation of Nephropathy and Diabetes (FIND) consortium, studied more than 2,100 participants of the FIND study and the Choices for Healthy Outcomes in Caring for ESRD (CHOICE) study. FIND, one of the largest multicenter genetic studies of kidney disease ever conducted, has been funded by the NIH's National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) since 1999.

"*MYH9* genetic variations account for some of the excess risk of kidney disease due to hypertension, and much of the excess risk due to FSGS and HIV-associated FSGS in African Americans," said Jeffrey B. Kopp, M.D., a kidney specialist and lead author of the NIH study. "We hope this finding will lead to personalized medical therapy that will reduce the burden of chronic kidney disease."

Though diabetes is one of the leading causes of kidney failure, both research teams found no association between the *MYH9* variants and diabetes-related kidney failure in African Americans.

"This finding suggests that the mechanisms leading from onset of chronic kidney disease to kidney failure may differ based on the inciting cause," said W.H. Linda Kao, Ph.D., M.H.S., and Rulan S. Parekh, M.D., M.S., the lead and senior authors of the Johns Hopkins study. "Therefore, understanding the role that *MYH9* plays in kidney failure may ultimately lead to development of drug therapies that target more specific, rather than common, genetic pathways to prevent kidney disease progression more effectively."

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Kidney Disease
Research Updates

NKUDIC
www.kidney.niddk.nih.gov

Kidney Disease Research Updates, an email newsletter, is sent to subscribers by the National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC). The newsletter features news about kidney disease, special events, patient and professional meetings, and new publications available from the NKUDIC and other organizations.

If you would like to subscribe, go to *http://catalog.niddk.nih.gov/newsletter.cfm*. You can read or download a PDF version of the newsletter at *www.kidney.niddk.nih.gov/about/newsletter.htm*.

Executive Editor: Andrew S. Narva, M.D., F.A.C.P.

Dr. Narva is the director of the National Kidney Disease Education Program (NKDEP) within the National Institute of Diabetes and Digestive and Kidney Diseases. Dr. Narva, a graduate of Harvard Medical School and board-certified in internal medicine and nephrology, served with the Indian Health Service before joining the NKDEP. He also was a member of the National Kidney and Urologic Diseases Advisory Board, the Renal Community Council of the U.S. Renal Data System, the Medical Review Board of End-Stage Renal Disease Network 15, and the National Kidney Foundation's Minority Outreach Committee, which he chaired.

Researchers Seek Children for Urinary Tract Disorder Study

Researchers conducting a study to learn if children with a urinary tract disorder known as vesicoureteral reflux (VUR) should receive extended antibiotic treatment are seeking to enroll more participants. The Randomized Intervention for Children with Vesicoureteral Reflux (RIVUR) study is funded by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) at the National Institutes of Health.

"The RIVUR study has the potential to help us understand how to provide the best care for thousands of children diagnosed every year with this condition."

Marva Moxey-Mims, M.D.
Director, Pediatric Nephrology Program, Division of Kidney, Urologic, and Hematologic Diseases, NIDDK

Urine normally flows down to the bladder through tubes called ureters. VUR is the abnormal flow of urine from the bladder back up into the ureters. VUR is the most common functional abnormality of the urinary tract in children. Between 30 to 50 percent of children with urinary tract infections (UTIs) have VUR, which is thought to increase the risk of kidney damage when children have recurring UTIs. At least 30 percent of children who have at least one UTI will have a recurrence.

Researchers seek to enroll 600 participants in the study. Participants must be between the ages of 2 months and 6 years and have had their first UTI within the 16 weeks before their first study visit.

With the approval of 20 institutional review boards and an external data safety monitoring board charged with overseeing the safety of children in the trial, each participant receives a daily dose of an antibiotic or a placebo for up to 2 years. Children who develop recurring fever

or other symptoms of infection or scar tissue buildup in the kidneys will be switched from the study to routine antibiotic care and referred to a urologist, depending on the number of infections and degree of renal scarring.

"The RIVUR study has the potential to help us understand how to provide the best care for

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"These two studies are important not only because the *MYH9* risk variants account for nearly all the excess burden of FSGS and HIV-associated kidney disease in African Americans, but also because *MYH9* is the first kidney disease gene identified that explains an important health disparity and involves common forms of kidney disease," said Cheryl Winkler, Ph.D., principal scientist with the National Cancer Institute, senior author of the NIH intramural study, and a co-author of the Johns Hopkins study. "In addition, the *MYH9* gene's estimated relative risk is higher than that observed for nearly all genetic factors discovered by genome-wide scans, including those for prostate cancer, diabetes, cardiovascular disease, breast cancer, and hypertension."

This research also was supported by the National Cancer Institute; the National Heart, Lung, and Blood Institute; the Agency for Healthcare Research and Quality; and the National Center for Research Resources through its General Clinical Research Centers.

For more information about kidney disease, visit *www.kidney.niddk.nih.gov*. ■

Intensive Dialysis Does Not Improve Outcomes for Acute Kidney Injury

People with acute kidney injury who received intensive dialysis did not have significantly different death rates or other outcomes compared with those who received standard dialysis, according to a joint study by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and the U.S. Department of Veterans Affairs (VA).

"We now have definitive evidence that intensive treatment of acute kidney injury is no more beneficial in improving treatment outcomes than the usual level of care."

Elias A. Zerhouni, M.D.
NIH Director

Earlier studies of people with acute kidney injury, or acute renal failure, at single medical centers suggested improved survival with more intensive dialysis, which is more costly.

Definitive Evidence

"We now have definitive evidence that intensive treatment of acute kidney injury is no more beneficial in improving treatment outcomes than the usual level of care," said National Institutes of Health (NIH) Director Elias A. Zerhouni, M.D. "As a result, the findings of this well-designed study may help prevent unnecessary medical expenditures."

Within 60 days after starting intensive dialysis treatment, 53.6 percent of participants died, compared with 51.5 percent of participants in the less-intensive treatment group. The study also found no significant differences between the two groups in recovery of kidney function, the failure rate of organs other than the kidneys, or the number of participants able to return to their prior living situations.

Currently, no medications effectively treat acute kidney injury. Hemodialysis and other forms of renal-replacement therapy support patients whose kidneys fail to function properly. During hemodialysis, a machine cleans waste and extra fluid from the blood when the kidneys cannot do the job.

"The main purpose of this study was to see if intensive therapy would reduce the death rate, shorten the duration of the illness, and decrease the number of new complications in other organs among patients with acute kidney injury," said study co-author Robert A. Star, M.D., director of the NIDDK's Division of Kidney, Urologic, and Hematologic Diseases. "Though this was found not to be the case, it is important that we know this so we can focus future research on finding more beneficial treatment strategies."

The Acute Renal Failure Trial Network study enrolled 1,124 critically ill patients from 17 VA medical centers and 10 university-affiliated medical centers across the United States. The study ran from November 2003 through July 2007.

The National Kidney and Urologic Diseases Information Clearinghouse has more information about kidney failure at *www.kidney.niddk.nih.gov/kudiseases/topics/failure.asp.* ■

Maintaining Access Sites for Hemodialysis Continues to Pose Challenges

Reducing early blood clots in bloodstream access for kidney failure treatment does not increase the chances of the access site becoming suitable for long-term dialysis.

"Because vascular access is critical for delivering lifesaving care, we are already organizing another multicenter study to better understand why some fistulas fail and how to improve their function once they are placed in dialysis patients."

Catherine M. Meyers, M.D.

The Dialysis Access Consortium (DAC), funded since 2000 by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), found that only 12 percent of patients developed blood clots in a fistula when treated with the clot-preventing drug clopidogrel, or Plavix, compared with nearly 20 percent of patients who did not take the drug. Despite this, about 60 percent of new fistulas in each group still could not be used for dialysis treatments. Complications such as bleeding were similar across the study groups.

A fistula—an enlarged vessel where blood is removed and returned to the body during dialysis treatments—is a type of vascular access for hemodialysis. While other types of dialysis vascular access such as synthetic grafts are available, fistulas are preferred because they are less likely than the others to clot and get infected. They also are less costly. However, the failure of fistulas to mature, or enlarge over time, can prevent their effective use. Clotting, infection, and low blood-flow rates in the access site are common reasons for hospitalization of hemodialysis patients, who then must undergo further treatments or surgeries to maintain their fistula.

Lifesaving Treatment

Surgeons create fistulas by joining a section of an artery and a vein to make one large vessel capable of handling high volumes of blood during hemodialysis, a treatment for people with kidney failure. Wastes and extra fluid are filtered from the bloodstream through the vascular access. Most of the 470,000 Americans with kidney failure depend on hemodialysis for survival.

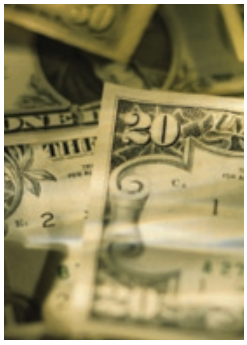
The DAC studied nearly 900 participants at nine U.S. medical centers in academic and community practices in urban and rural settings. Participants received a new fistula and took Plavix or a placebo daily for 6 weeks to determine whether the drug would maintain blood flow in fistulas and increase the number of fistulas suitable for use in regular dialysis treatments.

"Because vascular access is critical for delivering lifesaving care, we are already organizing another multicenter study to better understand why some fistulas fail and how to improve their function once they are placed in dialysis patients," said study co-author Catherine M. Meyers, M.D., a kidney specialist who oversees the DAC.

The NIDDK has a fact sheet about vascular access for hemodialysis at *www.kidney.niddk.nih.gov/kudiseases/pubs/vascularaccess.* ■

Grants Available to Research Impact of Health Communication on Dietary Behavior

The National Institutes of Health (NIH), along with the Centers for Disease Control and Prevention and the U.S. Food and Drug Administration, has issued a funding opportunity announcement (FOA) for research projects focused on creating and executing communication strategies to change dietary behaviors to improve health.



The FOA is designed to promote interdisciplinary research at multiple levels—individual, environmental, and policy—and across diverse populations. Research targeting populations at high risk for obesity, such as children, teenagers, and minority populations, is encouraged.

The funding will be awarded as R01 and R21 grants. The NIH R01 grant

- supports a discrete, specified, circumscribed research project
- is the NIH's most commonly used grant program
- is not limited to a specific dollar amount unless specified in the FOA
- requires advance permission for $500,000 or more in direct costs in any year
- is generally awarded for 3 to 5 years

The NIH R21 grant

- encourages new, exploratory, and developmental research projects by supporting the early stages of project development
- is sometimes used for pilot and feasibility studies
- limits funding to 2 years
- usually limits the combined budget for direct costs for the 2-year project period to $275,000
- generally requires no preliminary data

For complete information about applying for the R01 grant, go to *www.grants.nih.gov/grants/guide/pa-files/PA-08-239.html.* For more information about the R21 grant, go to *www.grants.nih.gov/grants/guide/pa-files/PA-08-240.html.* ■

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thousands of children diagnosed every year with this condition," said Marva Moxey-Mims, M.D., director of the NIDDK's pediatric nephrology program in the Division of Kidney, Urologic, and Hematologic Diseases. "In addition to finding out if antibiotics reduce the risk of UTIs, we also need to understand the progression of renal scarring and the development of resistance to antibiotics in these children."

Renal scarring occurs between 5 and 40 percent of the time when a child has a UTI. Scarring may accumulate with each infection and can lead to progressive kidney failure and the need for renal replacement therapy, such as dialysis.

About 50 years ago, physicians began to prescribe an ongoing regimen of daily antibiotics for children with VUR, based on the belief that treatment would prevent infection and reduce scarring and kidney failure. Unfortunately, the number of children developing kidney failure from VUR has not changed in that time, leading physicians to question the value of this practice and adding to concerns about increasing antibiotic resistance in the general population.

The National Kidney and Urologic Diseases Information Clearinghouse has more information about VUR at *www.kidney.niddk.nih.gov/kudiseases/pubs/vesicoureteralreflux.* For more information about the RIVUR study, go to *www.clinicaltrials.gov/ct2/show/NCT00405704?term=RIVUR&rank=1.* ■

NIDDK Workshop Pursues Better Ways to Assess Kidney Function and Disease

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) tapped the expertise of academic, Government, and industry scientists during a June workshop to explore ways of assessing kidney function and damage, including the development of new biomarkers and imaging techniques and clinical trials to test them.

"The ideal biomarker for chronic kidney disease would be something that is noninvasive, reliable, and a simple tool that can be used for diagnosing and determining the severity of disease, risk for progression, the most appropriate therapy, and the response and toxicity of a particular therapy."

Catherine Stehman-Breen, M.D., M.S.
Vice President of Global Development, Amgen

The workshop was in part a response to the growing problem of chronic kidney disease (CKD), estimated to affect 26 million Americans. Early CKD has few symptoms and often progresses untreated.

"Chronic kidney disease and end-stage renal disease together consume about 27 percent of the Medicare budget," said Robert A. Star, M.D., director of the NIDDK's Division of Kidney, Urologic, and Hematologic Diseases. "We need new biomarkers, outcome measures, assessment tools, and imaging methods."

Quest for Biomarkers

Finding an alternative to measuring serum creatinine, a normal waste product in the blood and the most frequently used biomarker for assessing kidney function, was a central theme of the workshop. Doctors use creatinine levels to estimate the glomerular filtration rate (GFR), an indirect measure of the kidneys' filtering capacity. However, creatinine's natural tendency to vary based on a person's age, sex, muscle mass, diet, ethnicity, and physical activity limits its practical usefulness in guiding patient care. And, according to Star, designing clinical trials around creatinine is quite difficult.

"The ideal biomarker for chronic kidney disease would be something that is noninvasive, reliable, and a simple tool that can be used for diagnosing and determining the severity of disease, risk for progression, the most appropriate therapy, and the response and toxicity of a particular therapy," said Catherine Stehman-Breen, M.D., M.S., vice president of global development at the biotechnology company Amgen. But "we are not likely to find a biomarker that can do all of these things."

Assessment panels comprising multiple biomarkers may be required to accurately assess kidney function. Biomarkers can be simple—such as blood pressure or an x ray—or complex, such as genes or substances in the blood, urine, or tissue.

Cystatin C is a leading candidate for inclusion in a kidney function assessment panel geared toward detecting early kidney disease. Unlike creatinine, serum levels of cystatin C are believed to be relatively independent of age, sex, and muscle mass, said Michael Shlipak, M.D., chief of the general internal medicine division at the San Francisco Veterans Administration Medical Center. "Cystatin C captures early preclinical impairment of GFR that is not detected by creatinine-based estimates of GFR."

Other potential biomarkers for kidney function or injury assessment discussed at the workshop include

- kidney injury molecule-1 (KIM-1)
- neutrophil gelatinase-associated lipocalin (NGAL)
- interleukin-18 (IL-18)
- interleukin-6 (IL-6)
- N-acetyl-ß-D-glucosaminidase (NAG)
- L-type fatty acid binding protein (L-FABP)
- albumin
- B2-microalbumin

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- glutathione S-transferase-a (GST-a) and glutathione S-transferase-p (GST-p)
- alkaline phosphatase
- gamma-glutamyl transpeptidase (GGT)

Imaging Methods

Workshop attendees also discussed a range of conventional and emerging imaging techniques. Magnetic resonance imaging, ultrasound, novel contrast studies, and plasma clearance techniques can measure GFR but are underused, according to Bruce Molitoris, M.D., director of both nephrology and the Center for Biological Microscopy at Indiana University. "Nephrology personnel do not understand radiology; radiologists do not understand the kidney," he said, citing the need for an interdisciplinary approach to assessing kidney function.

"We may need different surrogates for early versus later-stage disease and for early versus later-stage drug development."

Glenn Chertow, M.D.
Chief of Nephrology,
Stanford University

Participating scientists identified solutions, such as direct funding for interdisciplinary training programs, to close the gap among the nephrology, radiology, and engineering research communities. Such programs would encourage interaction and "synergize development of the field," said Molitoris.

The workshop also tagged methods ripe for clinical development, including studies for monitoring kidney size, oxygenation, inflammation, and regional perfusion. Perturbed kidney blood flow and renal reserve are also important areas that need further investigation.

Surrogate Endpoints

To expand and accelerate clinical trials, the workshop focused on identifying surrogate endpoints that can predict and substitute for real clinical endpoints. "We may need different surrogates for early versus later-stage disease and for early versus later-stage drug development," reported Glenn Chertow, M.D., chief of nephrology at Stanford University, who chaired a breakout session about designing clinical trials. U.S. Food and Drug Administration officials were on hand to outline the pilot process for qualifying surrogate endpoints and biomarkers.

"We are really at the bottom of the pile when it comes to the number of clinical trials conducted in chronic kidney disease," said Stehman-Breen, "and one of the reasons is the very long lag time between diagnosis and the ultimate, hard clinical endpoint of end-stage renal disease or death."

Candidate surrogate endpoints for acute kidney injury identified at the workshop include

- death
- dialysis or dramatic change in serum creatinine
- acidosis
- blood levels of potassium, phosphorus, and hemoglobin
- urine output
- doubling of cystatin C

Endpoints identified for CKD were

- slope in the estimated GFR/measured GFR
- doubling of serum creatinine
- proteinuria
- cyst enlargement in polycystic kidney disease
- mesangial expansion in type 1 diabetes
- GFR reserve
- fibrosis by biopsy
- impaired erythropoiesis
- hyperphosphatemia

The workshop stimulated interest in discovering and validating new biomarkers to improve the early diagnosis, staging, and prognosis of kidney disease and for use as intermediate or surrogate outcome measures that will ultimately improve the treatment of kidney disease.

The NIDDK is releasing a Request for Application for a chronic kidney disease discovery and validation consortium (RFA–DK–08–015) in December 2008.

For more information about kidney disease, visit *www.kidney.niddk.nih.gov.* ■

MedlinePlus Health Information Now Available in Multiple Languages

MedlinePlus, a consumer health portal from the National Library of Medicine (NLM), part of the National Institutes of Health, now features reliable health information in many languages. The collection of health resources contains more than 2,500 links to information in 44 languages covering nearly 250 health topics.

Users can navigate the new collection of health information either by language or topic. The page listing the 44 languages covered in the collection is located at *www.nlm.nih.gov/medlineplus/languages/languages.html*. The most commonly spoken languages included on the site are Chinese, Korean, Russian, Spanish, and Vietnamese. Links to foreign-language information can also be found on individual topic pages, such as the "kidney diseases" topic page at *www.nlm.nih.gov/medlineplus/kidneydiseases.html*.

MedlinePlus has information about kidney diseases in all of the languages listed in the right-hand column on that page.

Limited English Proficiency

According to a 2006 survey by the Health Research and Educational Trust of more than 850 hospitals, 80 percent of them treat patients with limited English proficiency. But despite nationwide demand, free, online consumer health information in multiple languages has not been readily available.

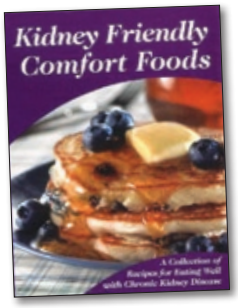
To be included on the MedlinePlus website, the multiple-language information must be produced by the Federal Government or a U.S.-based organization such as a hospital or medical association. The information also must be current, authoritative, and appropriate for a U.S. consumer audience.

To be included on the MedlinePlus website, the multiple-language information must be produced by the Federal Government or a U.S.-based organization such as a hospital or medical association.

"As the population of patients and consumers with limited English proficiency increases, more health care providers, patients, and family members will need information in languages from Hindi to Tagalog," said Paula Kitendaugh, head of the health information products unit in the NLM's public services division. "By creating a repository of authoritative, free, online information, we hope MedlinePlus will help meet that need." ■

Featured in the NIDDK Reference Collection

Eating with Chronic Kidney Disease



The second volume of the cookbook *Kidney Friendly Comfort Foods: A Collection of Recipes for Eating Well with Chronic Kidney Disease* features low-phosphorus recipes from a certified chef de cuisine who is also a nutritionist. Every recipe puts a low-phosphorus spin on an old favorite and is tailored to people with chronic kidney disease (CKD), including those with diabetes. This collection of recipes is updated annually and reviewed by a renal dietitian. Since 2006, the cookbook has been co-authored by celebrity chef Katie Lee Joel, the first-season host of the Bravo channel's television show "Top Chef."

The cookbook includes an introductory section that explains the basics of kidney disease, the role of dialysis, and medical nutrition therapy as part of managing end-stage renal disease and diabetes. Each recipe includes nutritional information and renal diabetic exchange list values. A brief list of resource organizations and other kidney-friendly cookbooks and resources is provided. The book is spiral-bound for easy use and illustrated with full-color drawings and photographs. To order a copy, go to *www.fosrenol.com/Consumers/ExclusiveOffers/Default.aspx.*

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) Reference Collection is a free, online database that helps health care professionals, health educators, patients, and the general public find educational materials not typically referenced in most databases. The NIDDK does not control or endorse the information contained in this collection; the information is provided as a convenience to our visitors. To find more resources about kidney disease, visit *www.catalog.niddk.nih.gov/resources.* ■

Additional Resources

Kidney Dysplasia and *Medullary Sponge Kidney*

The National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC) has published two new fact sheets that explain two kidney disorders that can develop before a child is born: kidney dysplasia and medullary sponge kidney.

Kidney dysplasia, which occurs during fetal development, is a condition in which the internal structures of one or both of the baby's kidneys fail to develop normally. Fortunately, this condition usually occurs in only one kidney. Babies with just one working kidney can grow and develop normally with few health problems. Infants with dysplasia in both kidneys may have impaired kidney function at birth, followed by progressive kidney failure.

Medullary sponge kidney (MSK) is a birth defect in which cysts form in the inner part of the kidney—or medulla—keeping urine from flowing freely through the kidney's inner tubules. Many people with MSK have no symptoms. Problems that could develop with MSK, such as blood in the urine, kidney stones, and urinary tract infections, usually don't appear until much later in life—between the ages of 30 and 40. MSK rarely leads to more serious problems, such as total kidney failure.

Kidney Dysplasia and *Medullary Sponge Kidney* explain the signs and symptoms of these disorders, as well as diagnosis and treatment. Copies of the fact sheets are available at *www.kidney.niddk.nih.gov/kudiseases/pubs/kidneydysplasia* and *www.kidney.niddk.nih.gov/kudiseases/pubs/medullaryspongekidney,* respectively.

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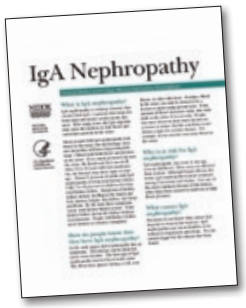
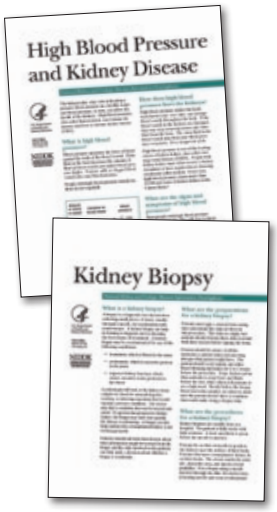


IgA Nephropathy

An NKUDIC fact sheet explains IgA nephropathy, a kidney disorder that occurs in association with deposition of IgA, a class of antibody in the kidneys. Over time, blood and sometimes protein appears in the urine. Kidney damage, and even kidney failure, can eventually result. The fact sheet also describes the risk factors, signs, causes, diagnosis, and available treatment for the condition. To view the fact sheet, go to *www.kidney.niddk.nih.gov/kudiseases/pubs/iganephropathy.*



Updated Publications

The NKUDIC has updated the following publications:

- *High Blood Pressure and Kidney Disease*
- *Kidney Biopsy*

These publications are available at *www.kidney.niddk.nih.gov/kudiseases/a-z.asp.* This site lists all available kidney and urologic publications in alphabetical order.

NKDEP Produces eGFR Resource for Providers

The National Kidney Disease Education Program (NKDEP) has a new resource available to help primary care providers and other health professionals explain the estimated glomerular filtration rate (eGFR) to people with chronic kidney disease.

Fact sheets that include simple explanations of the kidneys, kidney function, and eGFR test results can be torn off a pad and given to patients during their office visit. The fact sheets also include suggestions for maintaining kidney health based on the test results. The back of the pad highlights key concepts and talking points for providers to use when educating people about chronic kidney disease. To order up to five free copies of the pad, go to *www.nkdep.nih.gov.* Anyone interested in promoting the pad should contact the NKDEP at *nkdep@niddk.nih.gov.* A Spanish-language version of the pad is in development. ■

NIH Publication No. 09–4531
December 2008