ASN LEADING THE FIGHT AGAINST KIDNEY DISEASE

KidneyNews

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CMS to Provide Bonus Payments for Implementing Electronic Health Records

By Eric Seaborg

Illustration by Richard Lillash

Health care providers could receive financial incentives through Medicare or Medicaid for increasing their use of electronic records under a proposed plan the Centers for Medicare and Medicaid Services (CMS) unveiled late last year. The general reaction among potential participants in the program was support for the overall idea, but trepidation that CMS was asking providers to do too much too soon to qualify.

The program will provide bonus payments from Medicare or Medicaid to physicians, hospitals, and "eligible professionals" (EPs) for demonstrating a "meaningful use" of electronic health records (EHRs). Medicare providers who meet the requirements can receive incentive payments up to a total of $44,000 over five years, based on a formula of receiving a bonus equal to 75% of their Part B charges. Medicaid would provide an 85% bonus, with a maximum over

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Excessive Use of Calcium Supplements Seen as a Growing Problem

Pregnant Women and Postmenopausal Women Taking Supplements are among Those at Greatest Risk

By Tracy Hampton

Women are constantly bombarded with messages about maintaining their bone health and doing all they can to prevent osteoporosis as they age. Taking over-the-counter calcium supplements is one of the most widely touted ways women can help keep their bones strong.

Growing evidence indicates that taking excess amounts of calcium supplements has led to a resurgence of a serious condition that hasn't been on physicians' radars since the early 1900s—the milk-alkali syndrome. Researchers now suggest renaming the condition the calcium-alkali syndrome, to reflect a more modern definition of the illness.

Clinicians should keep in mind the potential for patients to develop this syndrome, which, if left unattended, can lead to kidney failure and other serious

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Inside

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Indication: Renvela® (sevelamer carbonate) is indicated for the control of serum phosphorus in patients with chronic kidney disease (CKD) on dialysis.

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Renvela is contraindicated in patients with bowel obstruction • Caution should be exercised in patients with dysphagia, swallowing disorders, severe gastrointestinal (GI) motility disorders including severe constipation, or major GI tract surgery • Uncommon cases of bowel obstruction and perforation have been reported • Serum bicarbonate and chloride levels should be monitored • Vitamins D, E, K (coagulation parameters), and folic acid levels should be monitored • The most frequently occurring adverse reactions in a short-term study with sevelamer carbonate tablets were nausea and vomiting • In a short-term study of sevelamer carbonate powder dosed three times daily, adverse events were similar to those reported for sevelamer carbonate tablets • In long-term studies with sevelamer hydrochloride, which contains the same active moiety as sevelamer carbonate, the most common adverse events included: vomiting, nausea, diarrhea, dyspepsia, abdominal pain, flatulence, and constipation • Cases of fecal impaction and, less commonly, ileus, bowel obstruction, and bowel perforation have been reported • Drug-drug interactions may occur with some medications and should be taken into consideration when instructing patients how to take Renvela • Patients should be informed to take Renvela with meals and to adhere to their prescribed diets

Please see Brief Summary of Prescribing Information on adjacent page.

Reference: 1. Renvela [package insert]. Cambridge, MA: Genzyme Corp; 2009.

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Bonus Payments

Continued from page 1

six years or $63,750. Providers can participate in one program or the other, but not both.

The funding comes through the American Recovery and Reinvestment Act of 2009 (popularly known as the economic stimulus bill passed last February), and could result in a huge—estimates range from $14 billion to $34 billion—federal investment in health information technology.

Extra payments are the carrot, but the program also includes a stick: Providers who do not adopt a certified EHR system within the next five years will face a reduction in their Medicare fee schedule payments of 1% in 2015, 2% in 2016, and 3% in 2017 and beyond.

The incentives program is slated to begin in 2011, with the highest payments available to those who sign up soonest. Systems need to be implemented by October 1, 2011, to qualify for the highest payments, a deadline that critics say is unrealistic, especially given that the certification program for the software is just being set up and software vendors may need to adjust their systems to meet the "meaningful use" requirements.

Staged implementation

The program will be implemented in three stages, with requirements increasing in each stage. Under the proposed rule, stage one criteria for physicians consist of 25 objectives and measures. EPs will be required to capture a high percentage of patient interaction into an electronic format, including the use of e-prescribing in at least 75% of permissible prescriptions, the incorporation of 50% of lab-test results that are in a positive/negative or numerical format, and the use of computer physician order entry (CPOE) in 80% of orders.

The criteria for stages two and three will grow progressively greater, but CMS plans to define them only after gaining some experience with the success of stage one.

The CMS proposal requires that EPs report on a set of three core clinical quality measures and a set of specialty-specific quality measures. The three core quality measures that must be included in a patient's record are: a patient's tobacco use, a blood pressure measurement, and whether the patient is receiving any "drugs to be avoided in the elderly."

The specialty-specific quality-measure for nephrology includes two measures for end stage renal disease patients (a care plan for inadequate hemodialysis and a care plan for inadequate peritoneal dialysis) and four measures involving chronic kidney disease (a list of laboratory tests, blood pressure management, care plan for patients receiving erythropoiesis-stimulating agents, and referral for arteriovenous fistula). The agency expects to narrow its specialty-specific lists in its final rule.

Comments urge revisions

CMS accepted public comments through March 15 and said it will release its final rule later this spring or summer. The comments from representatives of the gamut of affected providers—small practices to large hospital systems to health information specialists—generally urged CMS to scale back the requirements and give more time for implementation.

"The main issues are around the administrative burden being placed on providers, particularly how providers in smaller practices are going to be able to do what is being asked of them," Jason Mitchell, MD, assistant director of the Center for Health Information Technology at the American Academy of Family Physicians told *ASN Kidney News*.

"As strong proponents of the use of health information technology in the ambulatory setting, we encourage the administration to simplify the meaningful use criteria and qualifying procedures to ensure success of the program," William Jessee, MD, president of the Medical Group Management Association, said in a statement that cited "unreasonable thresholds for some meaningful use criteria."

The American Health Information Management Association responded with a 32-page letter of comments, many of them echoing the too-much too-soon theme. For example, the letter said that software vendors needed more time to develop the required functionality and suggested that CPOE should be considered an advanced use not required until stage two of the program.

Hospitals face different requirements from physicians and physician groups, but the American Hospital Association responded with similar concerns.

"As proposed, the regulations may actually make it more difficult for hospitals and doctors to adopt health information technology," Rick Pollack, executive vice president, said in a press release. "Unless

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High Hopes

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complications. In addition, nephrologists and others who care for patients experiencing kidney dysfunction should be aware of the possible role of calcium supplementation in the development of their patients' symptoms.

History and mechanisms behind the milk-alkali syndrome

The milk-alkali syndrome was first identified in the early 20th century when patients with peptic ulcers were treated with a regimen consisting of milk and antacids. The theory was that gastric acidity was the fueling force behind chronic ulcer disease, and that the milk-alkali treatment would protect the ulcer from gastric juice corrosion until the ulcer was healed. Throughout the day, patients drank a mixture of milk and cream and consumed substantial amounts of alkali. Due to its success, the milk-alkali therapy shortly became the standard of care for ulcer treatment. However, an unfortunate adverse effect was the development of hypercalcemia, various degrees of kidney failure, and metabolic alkalosis (Medarov BI. *Mayo Clin Proc* 2009; 84:261–267).

The pathogenesis of the syndrome is intricate and involves multiple systems, including bone, intestine, and kidney. The exact mechanism of the milk-alkali syndrome remains uncertain, but a unique interplay between hypercalcemia and alkalosis in the kidneys seems to lead to a self-reinforcing cycle. Absorption of large doses of calcium may lead to suppression of parathyroid hormone, which then produces enhanced bicarbonate retention by the kidney. Continued ingestion of calcium carbonate and bicarbonate retention leads to alkalosis, which causes increased calcium resorption in the kidneys. Also, hypercalcemia can lead to nephrogenic diabetes insipidus.

When histamine^2 blockers and proton pumps were introduced as alternative treatments to the standard milk and antacid regimen, the incidence of the milk-alkali syndrome became rare. In the 1970s and 1980s, the syndrome was considered responsible for less than 1 percent to 2 percent of hypercalcemia cases (Beall DP, Scofield RH. *Medicine Baltimore* 1995; 74:89–96).

Today's calcium-alkali syndrome

Physicians are noticing a resurgence of the milk-alkali syndrome because of the wide availability and increasing use of calcium supplements (particularly calcium carbonate), which are mostly taken to prevent bone loss and the development of osteoporosis. Research suggests that 8.7 percent of the American public takes calcium supplements (Kaufman DW et al. *JAMA* 2002; 287:337–344). Only multivitamins, vitamin E, and vitamin C are taken by a greater percentage of the population. Calcium is the second highest selling U.S. dietary supplement, behind multivitamins. The use of dietary supplements is primarily self-initiated rather than practitioner based.

The milk-alkali syndrome is now believed to be the third most common cause of in-hospital hypercalcemia (after hyperparathyroidism and malignant neoplasms), with a prevalence of 9 percent to 12 percent among hospitalized patients with hypercalcemia. In one study of patients hospitalized for emergent hypercalcemia, milk-alkali syndrome was the underlying cause in six (12 percent) of 49 patients admitted over a four-year period (Beall DP, Scofield RH. *Medicine Baltimore* 1995; 74:89–96).

A second study of patients hospitalized from 1998 to 2003 with hypercalcemia found that of 125 patients without end stage renal disease, 11 (8.8 percent) had the milk-alkali syndrome. Of those with severely elevated calcium, 9 (25.7 percent) of 25 had the milk-alkali syndrome (Picolos MK et al. *Clin Endocrinol (Oxf)* 2005; 63:566–576).

Stanley Goldfarb, MD, and Ami Patel, MD, of the Renal-Electrolyte and Hypertension Division at the University of Pennsylvania School of Medicine in Philadelphia, recently recommended changing the name of the milk-alkali syndrome to the calcium-alkali syndrome because the condition is now associated with a large intake of calcium, not milk (Patel AM, Goldfarb S. *J Am Soc Nephrol* 2010; doi:10.1681/ASN.2010030255 [published online ahead of print April 22, 2010]).

The condition usually has no symptoms, but when symptoms do occur, they may include back, middle of the body, and loin pain related to kidney stones, as well as excessive urination, fatigue, nausea, and other problems that can result from kidney failure (http://www.nlm.nih.gov/medlineplus/ency/article/000332.htm). If left unattended, patients with the milk-alkali, or calcium-alkali, syndrome may eventually need to be hospitalized.

Because the amount of calcium carbonate that has been reported to induce the milk-alkali syndrome varies from 4 to 60 grams per day, factors besides calcium intake must contribute to the development of the syndrome (Felsenfeld AJ, Levine BS. *Clin J Am Soc Nephrol* 2006; 1:641–654). Postmenopausal women, pregnant women, transplant recipients, patients with bulimia, and individuals who are on dialysis have the highest risks of developing the milk-alkali/calcium-alkali syndrome due to various physiological reasons (Patel AM, Goldfarb S. *J Am Soc Nephrol* 2010; doi: 10.1681/ASN.2010030255 [published online ahead of print April 22, 2010]).

Older patients are susceptible to advertising regarding the use of calcium supplements for the treatment of osteoporosis. Pregnant women experience enhanced calcium absorption through the gut. Patients with anorexia nervosa occasionally have fetishes for food rich in calcium. Cardiac transplant patients are sometimes given calcium carbonate as part of their therapy. And dialysis patients often ingest large amounts of magnesium oxide and calcium carbonate.

The obvious preventive strategy against the milk/calcium-alkali syndrome is to limit the intake of calcium to no more than 1.2 to 1.5 grams per day, said Goldfarb. In addition, supplementing calcium in a form that contains no absorbable alkali may be a wise choice.

"Calcium supplements taken in the recommended amounts are not only safe but are quite beneficial. Taken to excess is the problem," Goldfarb said.

Even then, careful monitoring of any medication is wise, and yearly determinations of blood calcium levels for those patients taking calcium supplements or vitamin D is a good idea, he added. The therapeutic dose of calcium carbonate

and the toxic dose of calcium carbonate are only about twofold different, at least for some individuals, according to Hal Scofield, MD, professor of edocrinology, metabolism, and diabetes and associate dean for Clinical & Translational Research at the University of Oklahoma Health Sciences Center, in Oklahoma City. The usual prescribed dose is 1200–1500 mg of elemental calcium for postmenopausal supplementation, while 2500–3000 mg of elemental calcium as the carbonate salt can produce the milk/calcium-alkali syndrome.

The development of the milk/calcium-alkali syndrome in women taking excess calcium highlights the potential dangers of taking too much of an over-the-counter medication or supplement that is ordinarily considered beneficial. "It is hard to generalize about this but many vitamins and supplements can lead to real clinical problems if taken to excess," Goldfarb said. "There are many other examples including use of Tylenol with coexistent liver disease, use of aspirin with a coexistent gastrointestinal ulcer, use of nonsteroidal anti-inflammatory agents in patients with hypertension."

Other experts point to hidden sources of calcium that individuals should note. "Many over-the-counter medications contain calcium carbonate. My colleagues and I have seen a number of patients with milk-alkali syndrome who were, unknown to the patient, getting calcium carbonate from multiple over-the-counter medications," said Scofield. "We should all read labels for dosing and ingredients." Heartburn medications are a typical example of over-the-counter drugs that contain calcium.

For most women, the chances of developing complications from osteoporosis are much higher than the risk of developing the milk/calcium-alkali syndrome. Even after its recent resurgence, the milk/calcium-alkali syndrome remains a relatively rare condition especially considering the widespread use of supplemental calcium, said Boris Medarov, MD, of the division of pulmonary and critical care medicine at the University of Southern California's Keck School of Medicine in Los Angeles. However, certain individuals should be particularly careful about their calcium intake.

"The average woman should not be concerned about it if she is healthy otherwise and she doesn't exceed the recommended daily dose of calcium, but individuals who suffer from kidney failure or chronic vomiting are more susceptible to the syndrome and should be especially vigilant about their calcium intake," said Medarov. "Those people need to consult their doctor regarding taking calcium supplements."

Pregnancy likely places women at risk for the syndrome due to increased intestinal absorption of calcium. Scofield and his colleagues performed a retrospective chart review of pregnant women with preeclampsia who were admitted for delivery to the University of Oklahoma Health Sciences Center. They found that 29 of the 100 pregnant patients had blood calcium levels above normal when corrected for low serum albumin compared with only six of 100 nonpregnant women who were admitted (Addington S et al. *J Okla State Med Assoc* 2006; 99:480–484). (He noted, however, that the correction of serum calcium for low serum albumin is not accurate in pregnant women.) One pregnant woman in the group developed the milk/calcium-alkali syndrome after taking 75 to 100 antacids a day for gastrointestinal symptoms occurring at the end of her pregnancy.

For individuals who do develop milk/calcium-alkali syndrome, ceasing intake of calcium supplements is of utmost importance. In addition, supportive therapy and hydration are helpful. Luckily, this condition is often reversible if kidney function remains normal. In refractory cases, hemodialysis may occasionally be necessary.

Bonus Payments

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significant changes are made and timelines reexamined, it is unlikely that the vast majority of hospitals can meet the proposed standards, making them ineligible for this important funding, and also subject to penalties for not being in compliance." Hospital-based physicians, defined as those who spend 90% or more of their time in hospital-based care, are not eligible to participate individually, on the assumption that their institution will participate.

In addition to the speed of implementation issue, another main line of comments focused on the program's "all or nothing" approach, suggesting that CMS consider partial payments to EPs who cannot manage to achieve the full meaningful use criteria.

To qualify, systems need not be implemented between now and the program start date. To avoid penalizing early adopters, practices that have already implemented systems will qualify for payments, although such systems may need to be beefed up to reach meaningful use standards.

Balancing act

Mitchell of the American Academy of Family Physicians noted that for healthcare providers, the implementation of an electronic system is a balancing act of weighing the costs against the benefits, and that the program provides financial incentives but at the cost of the burden of compliance.

CMS will now face a balancing act of its own, as it incorporates—or does not incorporate—many of the comments, balancing the desire to implement electronic reporting as quickly as possible against the danger that if the requirements are seen as too cumbersome, fewer providers will respond.

And even those comments calling for a loosening of requirements generally endorsed the movement to EHRs and the federal encouragement to adopt them. With its potential large investment of federal funds, the Obama administration is doing what it can to impress upon the medical community the importance it places on electronic records for greater efficiencies and reduction of errors.

Full details of the proposal can be found at the agency's website, http://healthit.hhs.gov, under the "Meaningful Use" section.

Industry Spotlight

Merger Nearly Doubles Patient Base of U.S. Renal Care

U.S. Renal Care Inc. announced it would buy Dialysis Corporation of America (DCA, Linthicum, Md.) for about $112 million.

U.S. Renal Care, which is based in Plano, Texas, will begin a tender offer of $11.25 per share for DCA. U.S. Renal Care is a privately held provider of outpatient dialysis services.

U.S. Renal Care Chairman and CEO Chris Brengard said in a statement the deal allows his company to build a stronger, more efficient national operation. "U.S. Renal Care and DCA each have built strong regional operations," he said. "DCA, like U.S. Renal Care, has a commitment to building joint ventures with nephrologists."

After closing, U.S. Renal Care will provide dialysis services to about 5500 patients in 84 outpatient dialysis facilities across nine states, reported *The Wall Street Journal*. It will also have more than 12 home dialysis programs and 24 dialysis programs within hospitals. In early May, before the deal went through, U.S. Renal Care's website noted the company had 55 clinics in Arkansas and Texas, caring for about 3000 dialysis patients—so the deal effectively gives U.S. Renal Care a population of almost twice as many patients.

DCA had a good year in 2009. According to its end-of-year news release:

- Operating revenues for 2009 were $98.9 million compared to $86.8 million for 2008, a 14 percent increase.
- Operating income was $6.8 million for 2009 compared to $6.2 million for 2008, a 9 percent increase.
- Operating revenues for the fourth quarter of 2009 were $25.6 million compared to $23.7 million for the same period last year, an 8 percent increase.
- Operating income was $2.3 million for the fourth quarter of 2009 compared to $2.2 million for the same period last year, a 3 percent increase.

Generic Drug Tussle in India

World markets are changing as large drug manufacturers take their clinical trials as well as their medications to new markets, particularly to countries with large populations like India and China.

The road to these deals, however, is not always smooth.

Cipla Ltd., the second largest drug manufacturer in India by value of the company, is still aiming to sell a generic version of a kidney cancer drug produced by Bayer, even though Bayer is fighting that plan. Cipla's generic version of Nexavar will be priced at a tenth of the cost of the Bayer drug, said Amar Lulla, the joint managing director of Cipla. Lulla said that the less expensive version will go for 27,960 rupees (or $620) compared with 280,000 rupees per month for the Bayer drug, according to Bloomberg news.

Bayer filed a lawsuit to block this move by Cipla and lost in the Delhi High Court. The case is pending before the Supreme Court of India and is listed for final arguments in August. Bayer has filed twice for injunctions against Cipla since 2008.

Because Indian law gives the patent holder exclusive marketing rights for 20 years without competition from generic companies offering the drug at lower costs, Bayer is arguing that the Drug Controller General of India cannot grant rights to Cipla. However, local health advocates and drug manufacturers argue that delaying the launch of low-cost drugs will adversely affect public health and harm those who need the medication.

According to Prashant Reddy, a barrister and intellectual property (IP) expert in India who has argued cases and maintains an IP website, the largest litigation issue is pricing. He noted in his IP blog that the U.K.'s National Health System turned down Bayer's drug for its formulary because of price.

Small Company Poised for Big Time

Rockwell Medical Technologies of Wixom, MI, is situated to move from R&D to a "high-margin drugmaker," according to *Crain's Detroit Business*. Rockwell started as a home-based son-and-family operation devoted to assembling dialysis kits and has grown into a company with 130 employees working in the sectors of end stage renal disease, chronic kidney disease, and iron deficiency anemia.

According to the company, its lead investigational drug, Soluble Ferric Pyrophosphate (SFP), is an iron salt that delivers iron in a way true to its physiology. SFP provides continuous iron maintenance therapy for the treatment or prevention of iron deficiency anemia in dialysis patients. It works so that iron is transferred at a cellular level, as dietary iron is, rather than as an IV treatment. SFP may be much cheaper to use than EPO, a hormone that controls red blood cell production in dialysis patients, *Crain's* reported.

Founder, President, and CEO Rob Chioni said in May, "Our gross profits and revenues increased substantially (in first quarter 2010), and our business operations generated positive cash flow, supporting our development efforts for SFP. Our major clinical development in the first quarter was the announcement of our Phase IIb study results, which demonstrated exceptional safety data and clear dosing data. We have submitted our request to the FDA for an end-of-phase-II meeting, which we expect will take place within 60 days."

Chioni said he expects revenues in 2010 to climb by at least 10 percent. Last year, Rockwell's annual revenue rose from $13.5 million to $14.8 million, and the company cut losses from more than $3 million to $549,781. In the first quarter of 2010:

- Sales increased to $15 million, up 17.1 percent compared to the first quarter of 2009.
- Gross profit increased to $2.3 million, up 94 percent or $1.1 million compared to the first quarter of 2009.
- Gross profit margins increased to 15.4 percent, compared to 9.3 percent in the first quarter of 2009.

R&D expense was $0.5 million, compared to $1.3 million in the first quarter of 2009.

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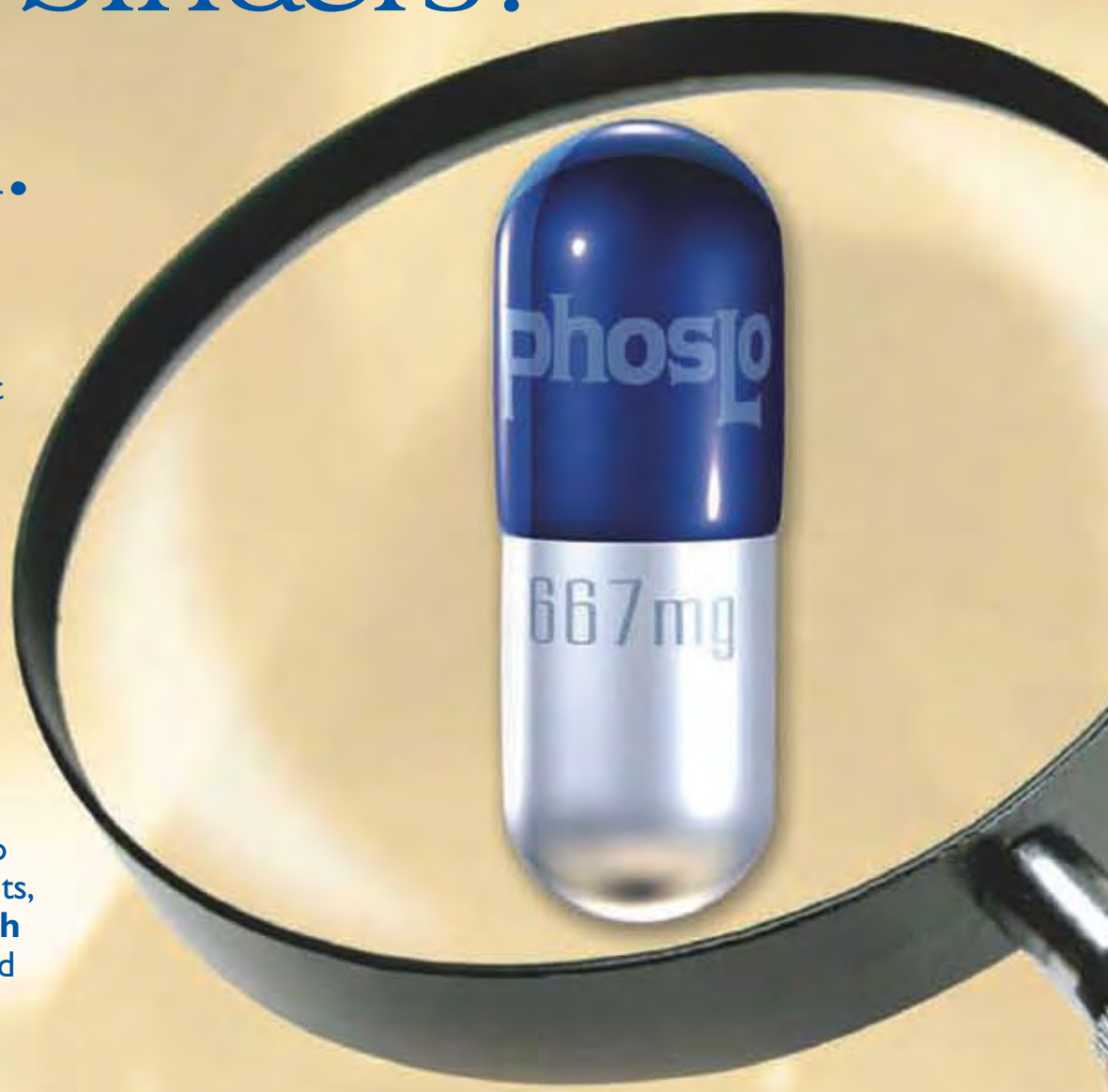

CARE Study

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CARE-2 Study

- The CARE-2 study demonstrated **NO significant difference in the progression of coronary artery calcification** following equivalent lipid control in the PhosLo and sevelamer treated groups.[2]

DCOR Study

- DCOR, a Genzyme-sponsored study, failed to achieve both primary and secondary endpoints, demonstrating **NO mortality benefits with sevelamer** when compared to calcium-based phosphate binders.[3]

DOPPS II Study

- DOPPS II showed **NO survival benefit of sevelamer** over calcium-based phosphate binders.[4]

- PhosLo is well tolerated with limited GI side effects.[5]
- PhosLo has not been associated with metabolic acidosis.[6]
- PhosLo offers potential cost-savings for patients.[7]

PhosLo® GelCaps
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PhosLo® is indicated for control of hyperphosphatemia in end-stage renal failure. Patients with higher-than-normal serum calcium levels should be closely monitored and their dose adjusted or terminated to bring levels to normal. **PhosLo® is contraindicated in patients with hypercalcemia.** No other calcium supplements should be given concurrently with PhosLo.® Nausea, hypercalcemia and pruritus have been reported during PhosLo® therapy.

BRIEF SUMMARY OF PRESCRIBING INFORMATION
CONTRAINDICATIONS: Patients with hypercalcemia. INDICATIONS AND USAGE: For the control of hyperphosphatemia in end-stage renal failure. WARNINGS: Patients with end-stage renal failure may develop hypercalcemia when given calcium with meals. No other calcium supplements should be given concurrently with PhosLo. Progressive hypercalcemia due to overdose of PhosLo may be severe as to require emergency measures. Chronic hypercalcemia may lead to vascular calcification, and other soft-tissue calcification. The serum calcium level should be monitored twice weekly during the early dose adjustment period. The serum calcium times phosphate (Ca x P) product should not be allowed to exceed 66. Radiographic evaluation of suspect anatomical region may be helpful in early detection of soft-tissue calcification. PRECAUTIONS: Excessive dosage induces hypercalcemia; therefore, early in the treatment during dosage adjustment serum calcium should be determined twice weekly. Should hypercalcemia develop, the dosage should be reduced or the treatment discontinued immediately depending on the severity of hypercalcemia. Do not give to patients on digitalis, because hypercalcemia may precipitate cardiac arrhythmias. Always start PhosLo at low dose and do not increase without careful monitoring of serum calcium. An estimate of daily calcium intake should be made initially and the intake adjusted as needed. Serum phosphorus should also be determined periodically. Information for the Patient: Inform the patient about: 1) compliance with dosage, 2) adherence to diet instructions and avoidance of nonprescription antacids, and 3) symptoms of hypercalcemia. Drug Interactions: PhosLo may decrease the bioavailability of tetracyclines. Carcinogenesis, Mutagenesis, Impairment of Fertility: Long-term animal studies have not been performed. Pregnancy: Teratogenic Effects: Category C. Animal reproduction studies have not been conducted. It is not known whether PhosLo can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Give to a pregnant woman only if clearly needed. Pediatric Use: Safety and effectiveness in pediatric patients have not been established. Geriatric Use: Of the total number of subjects in clinical studies of PhosLo (n = 91), 25 percent were 65 and over, while 7 percent were 75 and over. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out. ADVERSE REACTIONS: In clinical studies, patients have occasionally experienced nausea during PhosLo therapy. Hypercalcemia may occur during treatment with PhosLo. Mild hypercalcemia (Ca>10.5 mg/dl) may be asymptomatic or manifest itself as constipation, anorexia, nausea and vomiting. More severe hypercalcemia (Ca>12 mg/dl) is associated with confusion, delirium, stupor and coma. Mild hypercalcemia is easily controlled by reducing the PhosLo dose or temporarily discontinuing therapy. Severe hypercalcemia can be treated by acute hemodialysis and discontinuing PhosLo therapy. Decreasing dialysate calcium concentration could reduce the incidence and severity of PhosLo induced hypercalcemia. The long-term effect of PhosLo on the progression of vascular or soft-tissue calcification has not been determined. Isolated cases of pruritus have been reported which may represent allergic reactions. OVERDOSAGE: Administration of PhosLo in excess of appropriate daily dosage can cause severe hypercalcemia (see ADVERSE REACTIONS).

For more information on PhosLo®, please contact Fresenius Medical Care at **800-323-5188.**
Manufactured for and distributed by: Fresenius Medical Care North America, Waltham, MA 02451

Fresenius Medical Care

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Journal View

B-Vitamin Therapy May Worsen Diabetic Nephropathy

High doses of B-vitamins may lead to decreased kidney function and an increased risk of vascular events, according to a study in *The Journal of the American Medical Association*.

In the randomized "DIVINe" trial, 238 patients with a clinical diagnosis of diabetic nephropathy were assigned to B-vitamin therapy—folic acid 2.5 mg, vitamin B6 25 mg, and vitamin B12 1 mg in a single daily tablet—or to matching placebo. Radionuclide-measured glomerular filtration rate (GFR) and other outcomes were assessed at a mean follow-up of 31.9 months.

Contrary to the study hypothesis, the decrease in GFR was greater in patients assigned to B-vitamin therapy. At 36 months, the B-vitamin group had a 16.5 mL/min/1.73 m^2 decline in radionuclide GFR, compared to 10.7 mL/min/1.73 m^2 in the placebo group: a significant difference of 5.8 mL/min/1.73 m^2.

About 12 percent of patients in both groups needed dialysis. However, the B-vitamin group had a higher rate of vascular events—hazard ratio 2.0 for a composite of myocardial infarction, stroke, revascularization, or all-cause mortality. This was despite a significant reduction in plasma total homocysteine in patients assigned to B-vitamin therapy.

Diabetic nephropathy is associated with high levels of homocysteine, which are effectively lowered by B-vitamin therapy. However, the DIVINe results show a faster decline in renal function among patients receiving high doses of B vitamins.

The study treatment was also associated with a higher rate of myocardial infarction and stroke, despite lowering of plasma homocysteine levels. "[I]t would be prudent to discourage the use of high-dose B vitamins as a homocysteine-lowering strategy outside the framework of properly conducted clinical research," the investigators conclude [House AA, et al. Effect of B-vitamin therapy on progression of diabetic nephropathy: a randomized controlled trial. *JAMA* 2010; 303:1603–1609].

Good Initial Results with Novel Iron-Based Phosphate Binder

The new non-calcium, iron-based phosphate binder SBR759 shows evidence of clinical efficacy and safety, according to a preliminary trial reported in *Kidney International*.

The phase I, open-label study included 44 maintenance hemodialysis patients. All had controlled serum phosphorus on a constant dose of phosphate binder at baseline, with rising phosphorus levels during a washout period. Once the initial dose of 3.75 g/day was confirmed to be safe, dosage was escalated by cohort up to 22.5 g/day. Changes in serum phosphorus levels were assessed, along with safety and tolerability.

Patients receiving the 11.25 and 15.0 g/day doses of SBR759 had an average 2.1 mg/dL reduction in serum phosphorus level. Significant effects on serum phosphorus level were noted at all doses, and all groups achieved Kidney Disease Outcomes Quality Initiative target levels within the first week of treatment.

Treatment with SBR759 appeared safe and well tolerated at doses up to 15 g/day. Adverse events were mainly gastrointestinal and were most frequent at the supratherapeutic 22.5 g/day dose. There were no serious adverse events and no clinically significant changes in serum ferritin or iron saturation.

Even with available calcium and non-calcium phosphate binders, up to half of dialysis patients do not achieve target phosphorus levels. SBR759 is a unique, polymeric complex made of iron and starch that acts as a rapid and selective phosphate binder.

This initial clinical trial shows that SBR759 is a safe and effective phosphate-lowering treatment for hemodialysis patients. Formulated as a neutral, tasteless powder that can be taken in water or juice, SBR759 appears highly effective in achieving target phosphorus levels. Prospective, randomized trials are needed to determine the value of this iron-based phosphate binder for patients with chronic kidney disease [Block GA, et al. Efficacy and safety of SBR759, a new iron-based phosphate binder. *Kidney Int* 2010; 77:897–903].

ASN News

Sign up for the ASN Board Review Course & Update

ASN invites you to register for the Board Review Course & Update (BRCU), the nationally recognized preparatory course for the American Board of Internal Medicine (ABIM) initial certification and maintenance of certification examinations in nephrology and a comprehensive update for the practicing nephrologist. This course will take place from Saturday, August 28, to Friday, September 3, 2010, at The Palace Hotel in San Francisco.

The timing of the BRCU maximizes participants' readiness for the ABIM Nephrology Board Certification and Maintenance of Certification (MOC) examinations on November 4, 2010. The three months following completion of the course and the self-assessment test allow participants to fill in gaps in their knowledge.

ASN reevaluates and updates the BRCU program annually. Each topic section is patterned after the ABIM nephrology examination blueprint. Lectures, interactive case discussions, and panel Q & A sessions blend physiology and pathophysiology with clinical discussions. The course provides participants key reviews and updates and prepares them for the 2010 Board Certification and MOC examinations.

To register, reserve housing, and obtain additional information, please visit www.asn-online.org/brcu. Please register early to ensure your place at the 2010 course. The pre-registration deadline is **Wednesday, August 18, at 11:59 p.m. EDT**. Onsite registration may not be possible due to space limitations.

Renal Week 2010: ASN Continues to Expand Annual Meeting

ASN is adding new elements to the program for ASN Renal Week 2010, which takes place November 16–21, 2010, at the Colorado Convention Center in Denver. Changes include the addition of two new Cinical Nephrology Conferences, two In-Depth Nephrology courses, Sunday morning Clinical Nephrology Conferences, and an additional abstract category. The society will also provide several periods of time without scientific programming to allow attendees additional opportunities to visit the Scientific Exposition.

Visit the ASN website at www.asn-online.org to register for Renal Week, reserve your housing, and view an up-to-the-minute schedule of events.

New Abstract Category (Deadline for submissions Thursday, June 17)

The new category *Bioengineering and Informatics* will focus on all aspects of bioengineering and informatics including hemodynamics, local drug delivery, nanotechnology, sensors, bioinformatics, imaging (functional, cellular, molecular), and novel dialytic technologies.

New In-Depth Nephrology Courses (November 16–17)

Assessing Acid-Base Disorders: Focus on Metabolic Acidosis
Chairs: Nicolaos E. Madias, MD, FASN, and Horacio J. Adrogue, MD

Polycystic Kidney Disease (PKD): Translating Mechanisms into Therapy
Organized with the assistance of the Polycystic Kidney Disease Foundation
Chair: Benjamin D. Cowley, MD
Focus on PKD genes and proteins, basic mechanisms of PKD, imaging in PKD, renal complications, extrarenal manifestations, and reports on clinical trials.

Professional Development Seminar: Early and Mid-Career Components
Organized with the assistance of Women in Nephrology (WIN)
Chairs: Rochelle Cunningham, MD, and Anne Pesenson, MD
Expanded in 2010 to a one and a half day course; discussion will include basic and clinical science careers, academic medicine, private practice, and industry.

Scientific Exposition Unopposed Hours (November 18–20)

Many of the latest advances in pharmaceuticals, devices, imaging, and services help kidney professionals provide high quality patient care. The Annual Meeting schedule provides several unopposed periods on Thursday, Friday, and Saturday so members can visit the exposition hall to learn more about advances in kidney care (9:30–10:30 a.m. and 4–4:30 p.m. daily).

New Clinical Nephrology Conferences (November 21)

The Postgraduate Education Committee has added five clinical nephrology conferences to the programming schedule on Sunday morning, November 21. Stay tuned for details.

Medicine Online

Welcome to the ever-changing world of the Internet. Like it or not, new technology is altering science and medicine in ways never imagined. This issue of *Kidney News* includes discussions of these changes and what they mean to nephrology. Walter Jessen, PhD, a bioinformatician at Cincinnati Children's Hospital, provides a summary of the challenges we face in this new online world. Tejas Desai, MD, of East Carolina University, has developed a collaborative blog for point-of-service nephrology reference. Many readers, though, are at a more basic level. For you, we have the following Q&A.

What is a blog?

A blog, short for web log, is a user-generated web site. It may serve as a personal diary, an educational tool, a social outlet, or the web presence for a business. Blogs can be text and pictures, but may also include audio or video files. Blogs generally link to other websites such as source materials, and most include a mechanism for comments to generate online discussion. For an excellent example of useful blogs, see Renal Fellow Network (http://renalfellow.blogspot.com/).

What is a wiki?

A wiki is a group-edited document. One person may write an entry, but later readers may rewrite sections, make additions, or provide references or photographs. Reference links are common; comments are not. The most famous of these sites is the online encyclopedia, Wikipedia (http://en.wikipedia.org/wiki/Main_Page). The information on Web 2.0 in Table 1 comes from Wikipedia.

What is a folksonomie?

On these sites viewers vote for content or label it. For example, Digg (http://digg.com/) consists of content submitted from the web. As other readers view it, they can vote it up (digg it). Popularity of the content pushes it farther up its topic page on the Digg site. One labeling site, Delicious (http://delicious.com/), calls itself a social bookmarking site. Users assign searchable tags, which are informal labels or categories, to content. Sites can have multiple tags from multiple users, increasing the likelihood that the term you use to search for it will be associated.

What are social networks?

The biggest social network at the moment is Facebook (http://www.facebook.com), and baby boomers make up much of its membership. This site resembles a scrapbook, family dinner, event calendar, and high school reunion all rolled up into a big pretty package. It also offers games and other amusements.

Describing itself as "Facebook for professionals," LinkedIn (http://www.linkedin.com) provides a more formal atmosphere. Tools include resume uploads and recommendations. Collaboration with travel management sites lets you connect with others during trips. Groups can have discussions, and employers can find potential new hires within the site. Introductions to secondary links (the contacts of your contacts) can be requested, giving this power as a networking tool.

Twitter (http://twitter.com/), the newest net phenomenon, bills itself as a microblogging service to provide brief updates, or tweets, limited to 140 characters. Twitter provides highly interactive information in near real-time. CNN was reporting peaceful elections in June 2009 while Iranians were tweeting of deaths in the streets. The twitter hashtag, its labeling system, lets users search out content related to their interests. Various conferences now include a hashtag for tweets so everything said about the meeting can be found using search tools within the service.

A host of other sites serve other needs. Everyone has surely heard of YouTube (http://www.youtube.com/) where your home videos could be the next big thing. Other sites store photos. Some services provide location-based services using the GPS in your smart phone. Want to find the nearest pizza? Or know which friends are standing on the same street? Foursquare (http://foursquare.com/) and similar services can tell you. More than 30 sites allow sharing content in some form, as demonstrated by the automatic share icon collections available online (see figure).

The only constant in this brave new online world is change. By the time you read this column, something new will have begun online. Your patients may be using it; do you know what that means for you?

Pascale Lane, MD, is editor of ASN Kidney News

Table 1. What Is Web 2.0?

Search	Find things without prior categorization
Links	Connect people and things in an organic matter
Authoring	User-generated content including blogs and wikis
Tags	So-called "folksonomies" where users assign labels to sites
Extensions	Allow web sites to be applications, not just passive document presenters
Signals	Automatic notification of updated material, such as really simple syndication (RSS)

Adapted from http://en.wikipedia.org/wiki/Web_2.0

Did you know?

U.S. physicians show continued adoption of mobile and social media for professional purposes, as well as increasing dependency on digital resources at the point of care.

- About 99 percent of physicians are online. The average physician spends about eight hours online each week for professional purposes, up from just 2.5 hours in 2002.
- By May 2010, 72 percent of U.S. physicians owned smartphones, up from half owning these devices in 2007.
- Use of digital resources at the point of care has increased. A significant share of physicians go online during patient consultations. Most of this time is spent on handheld devices.
- An increasing number of patients are bringing health information they found online to the doctor's office—and more than half of physicians believe this research leads to a better informed patient.
- Two-thirds of physicians consume user-generated content for professional purposes.

Source: Taking the Pulse® v10.0: Physicians and Emerging Information Technologies, Manhattan Research

Medicine 2.0 and Participatory Medicine

By Walter Jessen

A transformation is occurring in science, specifically in the domains of health and medicine. Second generation Web technologies that facilitate interaction between users are changing the way health care professionals communicate with each other, as well as with patients, health consumers and biomedical researchers. Indeed, "Web 2.0" applications, including social networks (Facebook, Twitter, FriendFeed), video and photo sharing sites (YouTube, Flickr), social bookmarking and folksonomies (Digg, Reddit, StumbleUpon), blogs and wikis, are changing the way people communicate, collaborate, and find information that is both interesting and relevant. These technologies are bringing people together in an interactive space and enabling them to create and distribute content online in a manner that has never been possible before.

According to a recent study, 39 percent of physicians now communicate electronically with their patients.

Medicine 2.0 or "second generation medicine" is the science of maintaining and/or restoring human health through the study, diagnosis, and treatment of patients, leveraging Web 2.0 Internet-based services to collaborate, exchange information, and share knowledge. Physicians, nurses, biomedical students, and researchers who consume Web media can actively participate in the creation and distribution of content, helping to customize information and technology for their own purposes. Although the terms Medicine 2.0 and Health 2.0 are often used interchangeably, Medicine 2.0 typically refers to the science of medicine and the practice of treating patients, while Health 2.0 is focused on the business of health, including the delivery, quality, safety, and cost or efficiency of the people, a practice, or facility.

A suggested framework for Medicine 2.0 depicts three main user groups of current Medicine 2.0 applications: consumers/patients, health professionals, and biomedical researchers (1). This expands upon the previous definition of Medicine 2.0 to include several user groups with different levels of training and expertise outside the traditional domain of medicine. Five themes emerge from this model: social networking, participation, apomediation (i.e., networked collaborative filtering processes that help users navigate the flood of information afforded by the Internet and digital media), collaboration, and openness.

Online communication between physicians and patients is growing. According to a recent study, 39 percent of physicians now communicate electronically with their patients (2). Indeed, patients do more than just communicate with their doctors; they are active participants in Medicine 2.0. These "e-patients" use the Internet to access health information, connect with other patients, and collaborate with others to manage their health care. According to a Pew Internet study, 60 percent of e-patients access social media content related to health (3). Such a model of medical care, termed "participatory medicine," is based on the development of a team that includes the patient, patient groups, and specialized social networks, the entire health care team, and clinical researchers in a collaborative relationship. Participatory medicine requires openness, with equal and unobstructed access to all health data as well as equal rights in the decision-making process.

Unfortunately, with all the reliable health information online, an equal or greater amount of misinformation also exists. Anti-vaccination proponents and homeopaths have embraced digital media and exert considerable influence on patients. According to the National Assessment of Adult Literacy, only 12 percent of American adults have proficient health literacy; 14 percent have below the basic level of health literacy (4). Thus, health professionals and biomedical researchers have a duty to combat the growing body of health and medical misinformation on the Web, and to help educate health consumers on the basic information needed to make appropriate health decisions for the prevention or treatment of illness.

Medicine 2.0 provides a powerful approach to engage, educate, and empower end users. The themes emerging from Web 2.0 in health and medicine illustrate the evolution of our health system, and emphasize communication, participation, collaboration, apomediation, and openness. As medicine continues the shift to Medicine 2.0 to meet the health care needs of consumers, these themes will persist beyond the social applications and services offered today.

Change isn't coming to medicine, it's already here. Are you ready?

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Walter Jessen, PhD, is a cancer biologist and bioinformatician at Cincinnati Children's Hospital (http://www.walterjessen.com). Since 2006, he has promoted advances in biomedical research to encourage health literacy at Highlight HEALTH (http://www.highlighthealth.com). Dr. Jessen moderated the session "Medicine 2.0 and Science 2.0 – where do they intersect?" at the ScienceOnline 2010 conference in January 2010 (http://www.scienceonline2010.com).

Nephrology On-Demand an Easy and Quick Resource for Nephrology Learning

By Tejas Desai

Many physicians, health care extenders, and students increasingly use online educational resources. From databases to blogs, the amount of medical information one can access is growing exponentially. Unfortunately, much of this medical information is scattered on numerous websites, each designed for one specific audience only. As a result, physicians are learning and sharing information in isolation from medical trainees, nurses, students, and patients.

To prevent segregation of one user group from another, the division of nephrology at East Carolina University—Brody School of Medicine launched Nephrology On-Demand. Nephrology On-Demand is a simple-to-use, easy-to-navigate, integrated teaching platform that satisfies the combined educational needs of physicians, fellows, residents, medical students, nurses, and patients.

Nephrology On-Demand provides users a complete learning experience. Online learners can select teaching resources in various formats—audio, video, PowerPoint slides, text, and exams. Users can ask and/or answer questions that arise during their learning through Nephrology On-Demand's virtual discussion forum. The forum, which accompanies every teaching resource, allows users to share different ideas, clarify concepts with faculty nephrologists, and stimulate further discussions.

Users can anonymously evaluate the educational value of each teaching resource using Nephrology On-Demand's six-point transparent peer review system. The cumulative score (on a scale of one to 10) not only gives contributing authors insights into revising and improving the teaching value of their contributions, but also allows future users to discern high quality resources before they begin learning. These features give users of Nephrology On-Demand a complete learning experience.

True to its name, Nephrology On-Demand provides mobile support. Online learners can use a smartphone or PDA to access a dedicated mobile version. Regardless of connection speed (WiFi or cellular), users have complete access to teaching resources and can participate in discussions or virtual Q & A sessions. With Nephrology On-Demand mobile, health care providers have the flexibility to learn and discuss nephrology wherever and whenever they need to.

Finally, via a partnership with Google, Nephrology On-Demand tracks data in the following dimensions: loyalty of and level of engagement by visitors, visits and page views per unit time, access time and bounce rates per visit and topic, and more. By publishing this data, Nephrology On-Demand's successes and shortcomings will be transparent to its users.

We welcome you to start learning with Nephrology On-Demand. Our user-friendly and easy-to-navigate interface allows you to obtain accurate medical information quickly. Whether you want to use the increasing number of teaching resources, share knowledge with other users, or engage in stimulating, evidence-based conversations, Nephrology On-Demand brings you together with learners of different backgrounds and training to meet your educational needs. Registration and access are free for all users at www.nephrologyondemand.org

Tejas Desai, MD, is assistant professor of medicine in the division of nephrology and hypertension at East Carolina University—Brody School of Medicine in Greenville, NC.

Findings: American Transplant Congress

Residual Renal Function Similar among Elderly and Young Kidney Donors

Kidney donors over 65 and under 50 have similar residual renal function after undergoing nephrectomies using the retroperitoneoscopic approach, according to research presented at the American Transplant Congress.

The results come from an evaluation of 90 donors that began prior to the surgeries and continued for three years postsurgery at St. Luke's International Hospital in Tokyo and the Jichi Medical University of Tochigi, Japan.

"Although long-term studies are needed, the results provide a rationale for the continued use of elderly kidney donors, and may contribute to reducing chronic organ shortage," said Masahiro Yashi, MD, first author of the poster, and his colleagues.

The researchers analyzed retroperitoneoscopic live donor nephrectomies in three age groups: young, middle, and elderly. The elderly group included 20 patients over 65 with a mean age of 71.3 ± 4.6 years. The middle group's mean age was 57.1± 4.2, and they ranged in age from 50 to 65 years. The mean age of the young patients was 41.6 ± 6.2.

Gender, operative time, warm ischemia time, and rate of complications did not differ significantly among the three age groups.

To assess the patients' postoperative renal function, the researchers measured serum creatinine levels and determined the estimated glomerular filtration rate (eGFR) according to the formula developed by the Modification of Diet in Renal Disease Study Group.

One year postdonation, serum creatinine values increased to 1.00 ± 0.23 mg/dL in the young group, to 0.92 ± 0.22 mg/dL in the middle group, and to 1.08 ± 0.24 mg/dL in the elderly group. The eGFR for these groups decreased to 69 ± 10, 64 ± 7, and 60 ± 12 percent of its predonation value, respectively. However, at three years postdonation, there were minor differences between the young group and the other two groups.

Because laparoscopic surgery to remove a kidney expedites the donor's recovery, it may encourage more individuals to donate kidneys, the researchers noted in their poster "Elderly Donors Show Equivalent Residual Kidney Outcomes to Young Donors after Retroperitoneoscopic Kidney Donation."

"The number of elderly donors is recently increasing, but the use of elderly kidneys remains controversial in view of donor and graft survival," the researchers said. "At least, the safety of donors must be guaranteed, and this study was conducted to clarify the residual renal function of elderly donors."

High Normal Fasting Glucose Puts Kidney Transplant Patients at Risk for New Onset Diabetes

Chronic kidney disease patients whose fasting plasma glucose is high—for example, 90 or 110 mg/dL—but within the normoglycemic range are at increased risk for developing new onset type 2 diabetes after kidney transplant, Mayo Clinic researchers reported at the American Transplant Congress in San Diego.

The findings come from a retrospective, observational study of 377 patients who were not diabetic and thus were not being treated for diabetes prior to their transplant surgeries.

The one-year cumulative incidence of new onset diabetes after transplantation (NODAT) was 27 percent in this patient group, said Harini Chakkera, MD, MPH, assistant professor of nephrology and first author of the poster presentation "Predictive Risk of Pre-Transplant Fasting Glucose on the Development of New Onset Diabetes after Kidney Transplantation."

The Mayo Clinic study defined NODAT as either hemoglobin A1c ≥6.5 percent or fasting serum glucose ≥126 mg/dL, or as prescribed diet or medical therapy for diabetes mellitus between one month and one year posttransplant.

Patients with a fasting glucose of 90 mg/dL had a 1.81 relative risk of developing NODAT posttransplant compared to patients with a fasting glucose above 110 mg/dL, who had a 2.7 relative risk of developing NODAT.

"The bottom line is that even though the patient's pretransplant fasting glucose is in the normal range, a fasting glucose of 110 mg/dL is not the same in terms of the risk it confers for NODAT as a blood sugar level of 90 mg/dL," Chakkera said in an interview.

Patients in the study, all of whom received kidney transplants from 1999 to 2009, had a mean age of 49±15 years. Fifty-six percent of the patients were male, 70 percent were Caucasian, and 25 percent were obese, with a body mass index >30 kg/m^2 prior to transplant surgery. Posttransplant therapy included steroid maintenance immunosuppression for 44 percent of the patients at one month, 44 percent at four months, and 49 percent at one year.

Chakkera's research may help expedite the development of a comprehensive predictive model of pre-kidney transplant risk factors for NODAT that could be evaluated in prospective clinical intervention trials.

Kidney Transplantation as an Outpatient Procedure?

Some patients may be able to undergo kidney transplants as an outpatient procedure, according to a retrospective study at North Shore University Hospital (NSUH) in New York. Admitting selected patients on the day of the operation and releasing them after 23 hours may be a viable option, said Ernesto Molmenti, MD, PhD, who heads transplant surgery and is vice chairman of surgery at NSUH.

Molmenti and colleagues analyzed clinical and financial outcomes for 30 consecutive kidney transplant patients whose hospitalizations at NSUH were much briefer than the national average five-day length of stay for the surgery. The patients' allografts came from live donors and their hospital stays were four days or less, with no readmissions within the first seven posttransplant days. Sixty-one percent of the patients had hospital stays of just 48 hours. Financial data were available for 26 patients.

NSUH began discharging kidney transplant recipients after 48 hours after Molmenti and other members of the multidisciplinary transplant care team "noticed that on the day after surgery, our hospitalized patients were eating, drinking, and walking around," he said in an interview about the team's poster presentation at the American Transplant Congress in San Diego.

"We noticed that there was nothing specific we were doing in evaluating or caring for the patient that could not occur in the clinic on an outpatient basis," he said.

In patients who were discharged early, urinary catheters were removed the morning after surgery, and adequate oral intake of fluids occurred on the first postoperative day. If unable to tolerate adequate oral intake of fluid, patients were given maintenance intravenous fluids (routinely 100 mL/h) until they were able to drink water and other fluids.

Kidney transplant recipients who were healthy enough to go home but preferred to remain in the hospital were not discharged early. Patients discharged early were evaluated in the clinic the following day, Molmenti said. These patients received the same care in the clinic that they would have received if they were still hospitalized, but had the advantage of recovering at home.

Early discharge may lower transplant patients' risk of developing MRSA and other hospital-acquired infections, Molmenti said.

Nineteen of these patients were hospitalized for only two days. The average direct hospital costs per day were $61,896 for these patients. The median hospital charges per day and the mean hospital charges per day were $53,055 and $52,094, respectively.

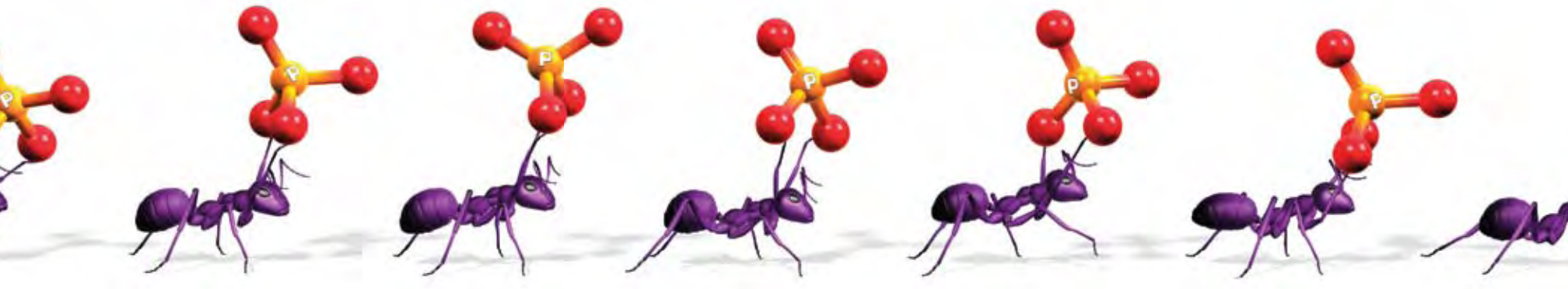
For the five patients who were hospitalized for three days, the average direct costs per day were $53,340. The median hospital charges per day and the mean hospital charges per day for these patients were $40,484 and $44,593, respectively.

Only two of the patients were hospitalized for four days, with average direct costs per day at $50,560. The median hospital charges per day and the mean hospital charges per day for these patients were both $$44,578.

The researchers said savings will depend on the hospitals' ability to diminish their costs during the 23-hour hospitalization period.

Continued on page 15

FOSRENOL® stays focused on the job



FOSRENOL removes phosphate, removes phosphate, remove

FOSRENOL is indicated to reduce serum phosphate in patients with end stage renal disease.

Important Safety Information

• Patients with acute peptic ulcer, ulcerative colitis, Crohn's disease, or bowel obstruction were not included in FOSRENOL® clinical studies. Caution should be used in patients with these conditions • There were no differences in the rates of fracture or mortality in patients treated with FOSRENOL® compared to alternative therapy for up to 3 years. The duration of treatment exposure and time of observation in the clinical program are too short to conclude that FOSRENOL® does not affect the risk of fracture or mortality beyond 3 years • FOSRENOL® tablets should be taken with or immediately after meals. Tablets should be chewed completely before swallowing. To aid in chewing, tablets may be crushed. Intact tablets should not be swallowed • No adequate and well-controlled studies have been conducted in pregnant women. FOSRENOL® is not recommended for use during pregnancy • The safety of lanthanum carbonate excreted in human milk is unknown. Caution should be exercised when FOSRENOL® is administered to a nursing woman • The use of FOSRENOL® in the pediatric population is not recommended • The most common adverse events for FOSRENOL® were gastrointestinal events, such as nausea and vomiting, and they generally abated over time with continued dosing. Gastrointestinal adverse events, such as nausea, diarrhea, and vomiting, were the most common type of event leading to discontinuation • Most common treatment-emergent adverse events were gastrointestinal (such as nausea and vomiting), dialysis graft complication, diarrhea, headache, and dialysis graft occlusion • Abdominal x-rays of patients taking lanthanum carbonate may have a radio-opaque appearance typical of an imaging agent

Please see Brief Summary of Full Prescribing Information on adjacent page.

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FOSRENOL® (lanthanum carbonate)

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BRIEF SUMMARY: Consult the Full Prescribing Information for complete product information.

FOSRENOL® (foss-wren-all)
(Lanthanum Carbonate) 500, 750, and 1000 mg Chewable Tablets.

INDICATIONS AND USAGE
FOSRENOL® is indicated to reduce serum phosphate in patients with end stage renal disease.

CONTRAINDICATIONS
None known.

PRECAUTIONS
General:
Patients with acute peptic ulcer, ulcerative colitis, Crohn's disease or bowel obstruction were not included in FOSRENOL® clinical studies. Caution should be used in patients with these conditions.

Diagnostic Tests:
Abdominal x-rays of patients taking lanthanum carbonate may have a radio-opaque appearance typical of an imaging agent.

Long-term Effects:
There were no differences in the rates of fracture or mortality in patients treated with FOSRENOL® compared to alternative therapy for up to 3 years. The duration of treatment exposure and time of observation in the clinical program are too short to conclude that FOSRENOL® does not affect the risk of fracture or mortality beyond 3 years.

Information for the Patient:
FOSRENOL® tablets should be taken with or immediately after meals. Tablets should be chewed completely before swallowing. To aid in chewing, tablets may be crushed. Intact tablets should not be swallowed.
Notify your physician that you are taking FOSRENOL® prior to an abdominal x-ray (see **PRECAUTIONS, Diagnostic Tests**).

Drug Interactions:
Lanthanum is not metabolized.
The absorption and pharmacokinetics of FOSRENOL® are unaffected by co-administration with citrate-containing compounds (see **CLINICAL PHARMACOLOGY: In Vitro/In Vivo Drug Interactions**).
An *in vitro* study showed no evidence that FOSRENOL® forms insoluble complexes with warfarin, digoxin, furosemide, phenytoin, metoprolol and enalapril in simulated gastric fluid. In studies in healthy volunteers, FOSRENOL®, when administered 30 minutes in advance, did not alter the pharmacokinetics of oral warfarin, digoxin, or metoprolol. However, it is recommended that compounds subject to reduced absorption when co-administered with antacids (e.g. aluminum-, magnesium-, or calcium-based) should not be taken within 2 hours of dosing with FOSRENOL®. Examples of relevant classes of compounds where antacids have been demonstrated to reduce bioavailability include antibiotics (such as quinolones, ampicillin and tetracyclines), thyroid hormones, ACE-inhibitors, statin lipid regulators and anti-malarials.
The bioavailability of oral ciprofloxacin was decreased by approximately 50% when taken together with FOSRENOL® in a single-dose study in healthy volunteers. It is recommended that oral quinolone antibiotics are not taken simultaneously with FOSRENOL®.
The bioavailability of levothyroxine was decreased by approximately 40% when taken together with FOSRENOL®. Consequently, thyroid hormone replacement therapy should not be taken simultaneously with FOSRENOL® and monitoring of TSH levels is recommended in patients receiving both medicinal agents.

Carcinogenesis, Mutagenesis, Impairment of Fertility:
Oral administration of lanthanum carbonate to rats for up to 104 weeks, at doses up to 1500 mg of the salt per kg/day [2.5 times the maximum recommended daily human dose (MRHD) of 5725 mg, on a mg/m^2 basis, assuming a 60-kg patient] revealed no evidence of carcinogenic potential. In the mouse, oral administration of lanthanum carbonate for up to 99 weeks, at a dose of 1500 mg/kg/day (1.3 times the MRHD) was associated with an increased incidence of glandular stomach adenomas in male mice.
Lanthanum carbonate tested negative for mutagenic activity in an *in vitro* Ames assay using *Salmonella typhimurium* and *Escherichia coli* strains and *in vitro* HGPRT gene mutation and chromosomal aberration assays in Chinese hamster ovary cells. Lanthanum carbonate also tested negative in an oral mouse micronucleus assay at doses up to 2000 mg/kg (1.7 times the MRHD), and in micronucleus and unscheduled DNA synthesis assays in rats given IV lanthanum chloride at doses up to 0.1 mg/kg, a dose that produced plasma lanthanum concentrations >2000 times the peak human plasma concentration.
Lanthanum carbonate, at doses up to 2000 mg/kg/day (3.4 times the MRHD), did not affect fertility or mating performance of male or female rats.

Pregnancy:
Pregnancy Category C. No adequate and well-controlled studies have been conducted in pregnant women. The effect of FOSRENOL® on the absorption of vitamins and other nutrients has not been studied in pregnant women. FOSRENOL® is not recommended for use during pregnancy.
In pregnant rats, oral administration of lanthanum carbonate at doses as high as 2000 mg/kg/day (3.4 times the MRHD) resulted in no evidence of harm to the fetus. In pregnant rabbits, oral administration of lanthanum carbonate at 1500 mg/kg/day (5 times the MRHD) was associated with a reduction in maternal body weight gain and food consumption, increased post-implantation loss, reduced fetal weights, and delayed fetal ossification. Lanthanum carbonate administered to rats from implantation through lactation at 2000 mg/kg/day (3.4 times the MRHD) caused delayed eye opening, reduction in body weight gain, and delayed sexual development (preputial separation and vaginal opening) of the offspring.

Labor and Delivery
No lanthanum carbonate treatment-related effects on labor and delivery were seen in animal studies. The effects of lanthanum carbonate on labor and delivery in humans is unknown.

Nursing Mothers:
It is not known whether lanthanum carbonate is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when FOSRENOL® is administered to a nursing woman.

Geriatric Use:
Of the total number of patients in clinical studies of FOSRENOL®, 32% (538) were ≥ 65, while 9.3% (159) were ≥ 75. No overall differences in safety or effectiveness were observed between patients ≥ 65 years of age and younger patients.

Pediatric Use:
While growth abnormalities were not identified in long-term animal studies, lanthanum was deposited into developing bone including growth plate. The consequences of such deposition in developing bone in pediatric patients are unknown. Therefore, the use of FOSRENOL® in this population is not recommended.

ADVERSE REACTIONS
The most common adverse events for FOSRENOL® were gastrointestinal events, such as nausea and vomiting and they generally abated over time with continued dosing.
In double-blind, placebo-controlled studies where a total of 180 and 95 ESRD patients were randomized to FOSRENOL® and placebo, respectively, for 4-6 weeks of treatment, the most common events that were more frequent (≥5% difference) in the FOSRENOL® group were nausea, vomiting, dialysis graft occlusion, and abdominal pain (Table 1).

Table 1. Adverse Events That Were More Common on FOSRENOL® in Placebo-Controlled, Double-Blind Studies with Treatment Periods of 4-6 Weeks.

	FOSRENOL® % (N=180)	Placebo % (N=95)
Nausea	11	5
Vomiting	9	4
Dialysis graft occlusion	8	1
Abdominal pain	5	0

The safety of FOSRENOL® was studied in two long-term clinical trials, which included 1215 patients treated with FOSRENOL® and 943 with alternative therapy. Fourteen percent (14%) of patients in these comparative, open-label studies discontinued in the FOSRENOL®-treated group due to adverse events. Gastrointestinal adverse events, such as nausea, diarrhea and vomiting were the most common type of event leading to discontinuation.
The most common adverse events (≥5% in either treatment group) in both the long-term (2 year), open-label, active controlled, study of FOSRENOL® vs. alternative therapy (Study A) and the 6-month, comparative study of FOSRENOL® vs. calcium carbonate (Study B) are shown in Table 2. In Table 2, Study A events have been adjusted for mean exposure differences between treatment groups (with a mean exposure of 0.9 years on lanthanum and 1.3 years on alternative therapy). The adjustment for mean exposure was achieved by multiplying the observed adverse event rates in the alternative therapy group by 0.71.

Table 2. Incidence of Treatment-Emergent Adverse Events that Occurred in ≥ 5% of Patients (in Either Treatment Group) and in Both Comparative Studies A and B

	Study A %		Study B %	
	FOSRENOL® (N = 682)	Alternative Therapy Adjusted Rates (N=676)	FOSRENOL® (N=533)	Calcium Carbonate (N=267)
Nausea	36	28	16	13
Vomiting	26	21	18	11
Dialysis graft complication	26	25	3	5
Diarrhea	23	22	13	10
Headache	21	20	5	6
Dialysis graft occlusion	21	20	4	6
Abdominal pain	17	17	5	3
Hypotension	16	17	8	9
Constipation	14	13	6	7
Bronchitis	5	6	5	6
Rhinitis	5	7	7	6
Hypercalcemia	4	8	0	20

OVERDOSAGE
There is no experience with FOSRENOL® overdosage. Lanthanum carbonate was not acutely toxic in animals by the oral route. No deaths and no adverse effects occurred in mice, rats or dogs after single oral doses of 2000 mg/kg. In clinical trials, daily doses up to 4718 mg/day of lanthanum were well tolerated in healthy adults when administered with food, with the exception of GI symptoms. Given the topical activity of lanthanum in the gut, and the excretion in feces of the majority of the dose, supportive therapy is recommended for overdosage.

DOSAGE AND ADMINISTRATION
The total daily dose of FOSRENOL® should be divided and taken with meals. The recommended initial total daily dose of FOSRENOL® is 1500 mg. The dose should be titrated every 2-3 weeks until an acceptable serum phosphate level is reached. Serum phosphate levels should be monitored as needed during dose titration and on a regular basis thereafter.
In clinical studies of ESRD patients, FOSRENOL® doses up to 3750 mg were evaluated. Most patients required a total daily dose between 1500 mg and 3000 mg to reduce plasma phosphate levels to less than 6.0 mg/dL. Doses were generally titrated in increments of 750 mg/day.
Tablets should be chewed completely before swallowing. To aid in chewing, tablets may be crushed. Intact tablets should not be swallowed.
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Findings: American Transplant Congress

Continued from page 12

African American and Caucasian Kidney Donors Differ in their Relationships with Recipients

African American kidney donors were more likely than Caucasian donors to be related to recipients—88.2 percent versus 76.7 percent—and to be first-degree relatives with the recipient (83.8 percent versus 67.9 percent) in a study conducted at Wake Forest University School of Medicine in Winston-Salem, NC. The analysis examined records of donors and recipients over an 18-year time period.

Numbers of sibling and spousal donations were similar in both African Americans and Caucasians. But compared to Caucasians, African Americans were more likely to participate in child-to-parent donations (30 percent versus 12 percent) and were less likely to participate in parent-to-child donations (15 percent versus 19 percent) (Table 1).

Caucasian donors were more likely than African American donors to be unrelated to the allograft recipient (7 percent versus 18 percent). The researchers also found that African American donors were younger than Caucasian donors and more often male.

The researchers identified 73 African American and 324 Caucasian donors during 1991 to 2009. Individuals who donated their kidneys specified their relationship, if any, to recipients. The mean age for African American donors and recipients was 33.6 ± 9.2 and for Caucasians, 39.6 ±10.5. Among African Americans, 41.2 percent were women, while 53.8 percent of Caucasians were women.

The researchers used t-tests for continuous variables and the chi-square or Fisher Exact Test as appropriate for categorical comparisons between the African American and Caucasian groups.

Future studies exploring cultural differences and family dynamics in African Americans and Caucasians may provide targeted recruitment strategies to encourage more individuals in both groups to donate a kidney to unrelated individuals as well as to relatives, the researchers said.

Amber M. Reeves-Daniel, DO, was the first author of the poster presentation titled "The Effect of Donor-Recipient Relationships on African American and Caucasian Live Kidney Donors."

Table 1. Donor's relationship to kidney transplant recipient

	African American	Caucasian
	(percent)	
child	30	12
parent	15	19
sibling	38	34
spouse	4	7
another relative	5	9
unrelated	7.4	16.7

Sublingual Tacrolimus Achieves Therapeutic Levels, with 100 Percent Kidney Graft Survival

Sublingual administration of the immunosuppressive drug tacrolimus quickly achieved therapeutic levels in 18 kidney transplant patients whose charts were reviewed in a retrospective cohort study, researchers reported at the American Transplant Congress.

Graft survival was 100 percent in this patient group, all of whom were discharged on sublingual (SL) tacrolimus after receiving either kidney transplants or kidney-pancreas transplants at Duke University Hospital from December 2007 to June 2009. Graft function remained excellent at six months and one year, the Duke researchers reported.

The SL approach is a potential alternative to oral administration of higher dosages of the drug to achieve target levels, or the addition of CYP3A4 inhibitors to bypass the limited and erratic absorption of tacrolimus in the patient's gut. Tacrolimus is characterized by intra- and interpatient variability in kinetics.

Prior to the Duke study, there were only two published case reports of SL tacrolimus in kidney transplantation. Researchers have previously published data showing that SL tacrolimus achieved therapeutic levels in lung and liver transplant recipients.

The Duke researchers said that the patients' tacrolimus levels remained within goal (> 8 ng/mL), even though the mean SL dose required at steady state was similar to the oral dose at conversion, and the drug's levels early after transplant were subtherapeutic.

Post-kidney transplant, the 18 patients received the standard immunosuppressant "cocktail" that included an anti-proliferative agent, steroid, as well as SL tacrolimus.

The mean age of patients was 41 ± 9.7 years, and the age range was 27 to 62 years. Most of the patients were African American, male, and recipients of living donor kidneys. A total of 89 percent of the patients received induction therapy that included daclizumab (DAC) and rabbit antithymocyte globulin (rATG). This short-term antibody therapy consisted of DAC 72 percent /rATG 17 percent).

In the 18 patients, the mean time to SL switch was 4 ±1 days. The mean level of tacrolimus levels at switch was 4.6 ± 2 ng/mL, despite the patients' being on a mean oral dose of 16.3 ± 4.2 mg/day. The mean time at which patients reached goal levels was 4 ± 3 days. Even with SL dosing, four patients also needed diltiazem to maintain goal levels.

Patients varied widely in their time on SL tacrolimus, which ranged from eight to 322 days. One death in the patient group was unrelated to tacrolimus dosing, and one case of moderate rejection occurred eight days after transplant and responded to steroid therapy, the researchers said.

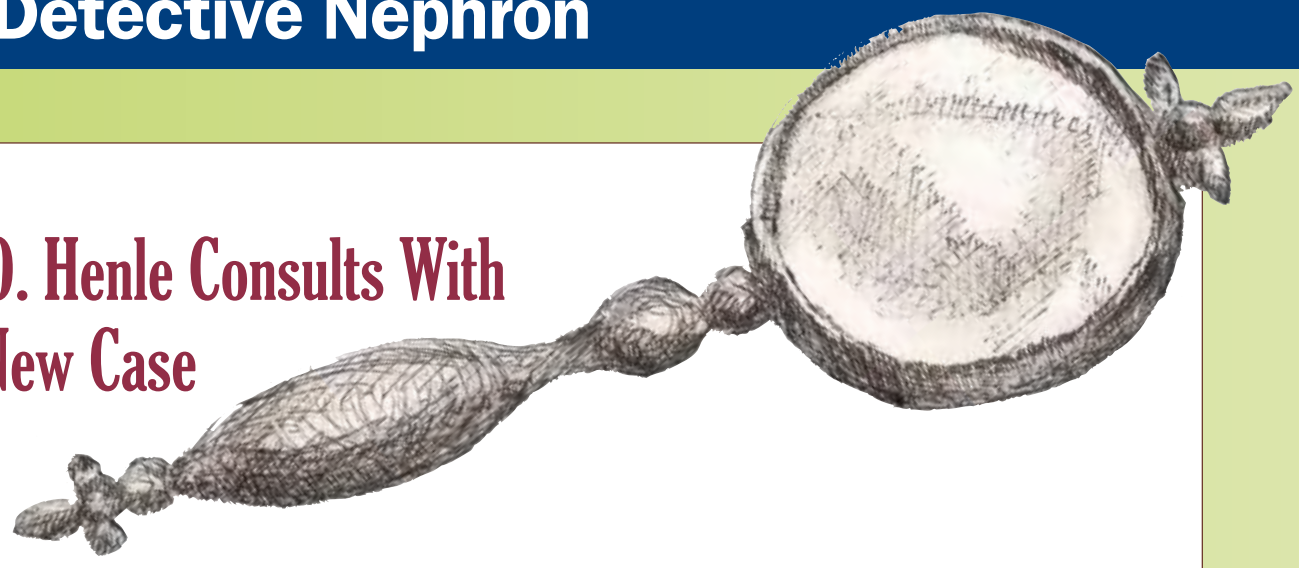
The poster presentation was titled "Sublingual Tacrolimus after High Risk Kidney Transplant."

ASN Kidney News Clarification

The photograph of Dr. Joseph Murray with dogs that received kidney transplants (March 2010 *ASN Kidney News*, p. 9) should have received the following credit: National Archives of Plastic Surgery in the Francis A. Countway Library of Medicine.

Index to Advertisers

Detective Nephron



Budding Nephrologist L.O. Henle Consults With Detective Nephron on a New Case

Nephron What do you have for me, Henle?

Henle A 40-year-old female with bilateral renal infarcts.

Nephron, excited Nice work, apprentice. Let's stop right there and discuss this case with just that information.

In general, renal infarction is rare. In the young woman you are presenting, it's intriguing what might be causing this. How did she present?

Henle She was in the usual state of health until she had headaches and was admitted for a stroke due to dissection of the vertebral artery. On the floor, she developed flank pain, and a CAT scan revealed bilateral moderate size renal infarcts. She has no past medical history and she was not taking any medications.

Nephron Fascinating. The presentation is typical. Most of these patients get missed because the pain mimics that of nephrolithiasis or pyelonephritis.

Henle, eagerly Those were ruled out by urinary studies and cultures.

Nephron They were not necessary because the CAT scan already gave you the answer. We are all aware of the enormous amount of testing done in this era of medicine.

After a pause…

Nephron Let me tell you more about renal infarcts. Two very common causes are low blood flow to the kidneys or clots being thrown to the kidneys. Since you are presenting this case to me, I shall assume that those causes were ruled out.

Henle Exactly. She has no cardiac history and no history of atrial fibrillation or diffuse atherosclerotic disease. She had a cardiac echocardiogram that was negative for any clots, atrial mass, or vegetations.

Nephron Excellent. Good work, detective. Now, tell me a little about her. Does she have hypertension? And why do I care?

Henle I knew you were going to ask me this. No, she was normotensive with a blood pressure of 115/78 and a heart rate in the 80s. She was never hypo- or hypertensive.

Nephron Most reports of renal infarction are due to clot emboli or diffuse vascular disease. Other potential embolic sources could be valvular vegetations or rarely fat emboli or paradoxical embolism from a patent foramen ovale. Did she have any recent surgery of her long bones?

Henle, prepared No, and she had no patent foramen ovale on ECHO.

Nephron, *deep in thought* Good work, Henle. Now what do we do?

Henle, with a curious look Could she have an arterial dissection of the aorta? And given the fact that she is a female, she could have fibromuscular dysplasia (FMD), or she could have vasculitis, perhaps medium-large vessel like Takayasu's or polyarteritis nodosa (PAN)?

Nephron, confidently Excellent differential. Although you are missing one set of diseases, let's go through each one of these and see if we can narrow down our search.

Henle Given her normal blood pressure and equal upper and lower extremity blood pressures, I would rule out the aortic dissection. Besides she might have been sicker. The other possibilities still have to be considered.

The detective listens carefully as his apprentice thinks out loud…

Nephron Great work. Keep in mind that FMD has normal inflammatory markers and vasculitis is the opposite.

Henle, smirking Yes, detective. Her erythrocyte sedimentation rate and C reactive protein were in the normal ranges. She had normal complements and she had a negative hepatitis and antiphospholipid antibodies.

Nephron By the way, what was her renal function like?

Henle Normal.

Nephron But she is normotensive.

Henle You are correct. What…how…why…?

Nephron, very excited Let me complete your MRI and magnetic resonance angiography (MRA) findings.

Henle Go ahead as she did get one.

Nephron She likely has multiple organ infarcts and aneurysms along with renal vessel infarcts.

Henle, astounded Yes. As a matter of fact, she has multiple fusiform aneurysms and narrowings of multiple splanchnic vessels, celiac artery, superior mesenteric artery, renal arteries, and iliac arteries. She also has a thrombosed left hepatic artery aneurysm that had progressed from the CAT scan. A CT angiogram of the heart showed no cardiac vessel tears.

Nephron, calm My dear, go examine her, she has a genetic disorder that is fascinating. Examine her limbs and fingers properly.

Henle exits and Detective Nephron resumes his readings.
A few hour pass, and Henle returns to the office for discussion.

Nephron So, what did you find?

Henle, very excited She has left-sided weakness that is new on the upper and lower extremities but most importantly, she has significant skin hyperelasticity and joint hypermobility that she was able to demonstrate. I think I know what she has now. She has Ehlers Danlos Syndrome (EDS) perhaps. But why doesn't she have FMD?

Nephron Well, let's take it a step at a time. She doesn't have any inflammatory markers that suggest vasculitis, so PAN is less likely. Although I am sure they must have done a muscle biopsy.

Henle Yes, and it was negative.

Nephron Now , FMD can involve bilateral renal vessels, vertebral vessels, and splanchnic and hepatic beds as in this case. Usually, the cases occur in women but most of the time with some form of hypertension. Classically, it occurs in the middle or distal arterial segments in young patients with not many cardiac risk factors. She mostly fits the description. Vascular EDS or EDS type IV has been associated with medial fibroplasias, and it should be suspected in patients with multiple aneurysms in addition to the typical features of FMD. This is a tough case my friend. The concern is also that if this is EDS type IV, the vasculature is very fragile, and any invasive tests such as angiography and percutaneous interventions should be avoided as their risk of tear increases.

Henle listens.

Nephron Vascular EDS is an autosomal dominant disorder that is caused by heterozygous mutations in COL3A1 gene encoding for type III procollagen. This leads to excessive tissue fragility and predisposes the premature arterial, intestinal, and uterine wall for rupture. This is the worst prognosis of all the EDS types. The most common radiological findings are arterial aneurysms and dissections followed by arterial ectasias and occlusions. In terms of FMD, this patient didn't have the classic beading seen in the angiography. MRA will not be conclusive and can give many false positives due to movement creating a beading like pattern. She didn't have beading on her MRA that we know of.

Henle No she didn't.

Nephron, with confidence I assume she gave you a history of easy bruising or hematomas?

Henle Yes she did.

Nephron What was her plasma renin level?

Henle, confidently It was normal, not high, going against FMD?

Nephron Correct again, Henle. But she is not hypertensive.

They pause…

Nephron I think that you have a diagnosis of EDS type IV or vascular variant given your physical exam findings, age of presentation, imaging findings, and good history taking technique.

Two weeks later, Henle returns to present results.

Henle You are not going to believe this. The genetic test was positive. She has vascular EDS. She was advised to avoid vascular interventions or traumas. She was referred to an EDS center for further care.

Nephron, pleased Excellent.

Henle She recovered from her stroke and is being discharged. Her renal function remained normal and she never became hypertensive.

Nephron, with a smirk Again, my dear apprentice, from a diagnosis of renal infarcts, you made a diagnosis of a life-threatening systemic disorder. Always be a good detective. Observe, think, read, and apply. If it doesn't cross your mind, you will never diagnosis it. Great case, Henle. Now let's go get some coffee.

Detective Nephron was developed by Kenar Jhaveri, MD, assistant professor of medicine at Hofstra Medical School and an attending nephrologist at North Shore University and Long Island Jewish Medical Center in Great Neck, NY. The column was inspired by Muthukumar Thangamani, MD, and Alan Weinstein, MD, both of Cornell University, and Mitch Halperin, MD, of the University of Toronto.

Policy Update

GAO: CMS Should Monitor Effect of Bundling on Dialysis Access and Quality

By Rachel Shaffer

The Centers for Medicare and Medicaid Services (CMS) should begin monitoring access to—and quality of—dialysis care as soon as possible after implementation of the new payment system, particularly for groups of beneficiaries with above-average costs of care, concludes a recently released report from the Government Accountability Office (GAO). GAO also suggests that CMS could use the information to help refine the system over time.

Commissioned in response to questions raised about the impact of the new bundled payment system for end stage renal disease (ESRD) care—effective on January 1, 2011—the report draws on USRDS data as well as interviews with clinicians and researchers with expertise in ESRD. In the course of its research, GAO sought input from ASN. The Society facilitated a discussion among GAO researchers and ASN members Jonathan Himmelfarb, MD, FASN; Glenn Chertow, MD; Jula Inrig, MD; Suzanne Watnick, MD; and Jeffrey Berns, MD.

Some beneficiary groups have above-average drug expenditures

Certain groups of dialysis patients have above-average Medicare expenditures for injectable ESRD drugs, the report found. African Americans in particular had higher than the average costs across all beneficiaries on dialysis in 2007. Medicare spending for patients with additional coverage through Medicaid was also higher than the average across all beneficiaries on dialysis.

Besides studying expenditures by demographic characteristics, GAO also collected information from nephrology clinicians and ESRD researchers on the factors they consider likely to result in above average doses of injectable drugs—ESAs, iron, and vitamin D. A majority of the nephrology experts interviewed by GAO identified primarily clinical factors, rather than demographic, as driving variation in these expenditures. Chronic blood loss, low iron stores, and recent hospitalization were among factors identified as likely to result in above average doses of ESAs.

CMS's preliminary monitoring plans build on existing initiatives…

GAO also examined CMS's plans for monitoring the effects of the new bundled payment system on beneficiaries.

CMS officials interviewed by GAO indicated that initial plans for monitoring build on three existing initiatives: the ESRD networks, the Clinical Performance Measures, and a survey and certification program (Table 1). In addition to these initiatives, the report notes that CMS has or is developing two other initiatives focused primarily on promoting the quality of dialysis care rather than monitoring—the Dialysis Facility Compare tool and a quality incentive program (QIP), with an implementation date of January 1, 2012.

…But extent to which CMS will monitor care for specific beneficiary groups is uncertain

Because CMS is still developing its monitoring plans, it is uncertain to what extent CMS will monitor the quality of dialysis care for specific groups of beneficiaries—such as those with above-average costs of care—under the new bundled payment system, according to the GAO report. The report emphasizes that the three existing CMS initiatives involve systematic monitoring of just one measure of access to care (the extent to which beneficiaries are involuntarily discharged from dialysis facilities).

GAO identifies possible opportunities to monitor patient access

Data needed to conduct more comprehensive monitoring of access for various groups of beneficiaries are available to CMS, GAO reports. Specifically, CMS could use the Dialysis Facility Report (compiled by the University of Michigan-Kidney Epidemiology and Cost Center) to compare characteristics of patients in facilities that open or close during a given year, indicating whether openings or closures affect availability of dialysis care for certain groups of patients more than others.

CMS also has the data needed to monitor changes in the use of dialysis services and shifts in sites of care, according to GAO. CMS could use data it collects in the process of paying claims for Medicare-covered services—such as ESRD drugs—as well as the CrownWeb database to monitor the use of dialysis services for groups of beneficiaries with above-average costs of care. Changes in the use of dialysis services could indicate how the new bundled payment system may be affecting patient access to services, GAO noted. With this data, CMS might, for instance, compare dialysis-related drug use between groups of beneficiaries and assess whether any usage discrep-

Table 1.
Current CMS Initiatives to Monitor the Quality of Dialysis Care

Quality Initiative	Description
ESRD Networks	Network responsibilities include: • monitoring facility-level indicators of the quality of dialysis care, such as anemia management and dialysis adequacy • evaluating and resolving patient complaints and grievances • collecting data on and tracking beneficiaries who were discharged from dialysis facilities involuntarily • providing technical assistance to dialysis facilities in developing and implementing quality improvement projects • identifying dialysis facilities not meeting network goals and assisting facilities in developing appropriate plans for correction.
Clinical Performance Measures (CPM) project	Under this project, CMS has collected, analyzed, and reported data on CPMs. The CPMs that CMS currently uses cover the following topics: (1) anemia management; (2) dialysis adequacy; (3) mineral metabolism; (4) vascular access; (5) influenza vaccination; (6) patient education, perception of care, and quality of life; and (7) mortality.
Survey and certification program	Facilities' compliance with Medicare's conditions for coverage is monitored through on-site inspections, called surveys, which are conducted by state survey agencies. Facilities must comply with these conditions in order for CMS to certify them for payment for Medicare-covered dialysis services. The conditions for coverage address issues such as patient safety and care.

Source: GAO Report: END-STAGE RENAL DISEASE - CMS Should Monitor Access to and Quality of Dialysis Care Promptly after Implementation of New Bundled Payment System., March 2010.

ancies were appropriate, GAO said. CMS could also monitor the extent to which beneficiaries receive emergency dialysis in hospitals rather than outpatient dialysis facilities. An increase in emergency dialysis services for certain groups could indicate that these groups face difficulty obtaining care in outpatient units.

Responding to the GAO's report, CMS reiterated that it plans to have a "comprehensive monitoring system" that examines care of all ESRD beneficiaries—including those with above-average costs—in place when bundled payments go into effect.

"With the implementation of any new payment system, CMS places its foremost concern on the impact of the change on beneficiary access and quality of care," said Center of Medicare Deputy Administrator and Director Jonathan Blum.

Blum also noted that GAO based its findings on interviews conducted with CMS staff before the Proposed Rule for the new ESRD Bundling was issued. However, GAO reports that it reviewed its findings with CMS staff after the release of the Proposed Rule in December 2009, and agency officials stated the information was accurate.

GAO is an independent, nonpartisan agency that produces reports and collects information upon request from Congress; its recommendations are nonbinding.

Learn more about the GAO Report on ASN's Patient Care Policy webpage (http://www.asn-online.org/policy_and_public_affairs/esrd-bundling.aspx), including:

- GAO Report Highlights Page
- Complete GAO Report
- Letter on GAO Report to Rep. Pete Stark & Rep. John Lewis from Deputy Administrator and Director, Medicare, Jonathan Blum

Institute of Medicine Calls for Mandatory National Standards for Sodium Content in Food

Americans consume unhealthy amounts of sodium in their food, far surpassing public health recommendations, according to an April report from the Institute of Medicine (IOM). Excessive sodium consumption increases the risk for high blood pressure, a serious health condition that is avoidable and can lead to a variety of diseases—including kidney disease.

Hypertension is a leading cause of kidney failure, and nearly 50 percent of people with kidney failure die from heart disease. People with chronic kidney disease (CKD) are at significantly greater risk for heart attacks and heart disease-related death.

The average consumer ingests more than twice the recommended daily amount of salt, primarily in the form of processed foods and restaurant meals—where, the IOM notes, it is often difficult to discern actual sodium levels.

Alarmed by increasing sodium levels, public health officials have launched numerous voluntary initiatives to reduce dietary salt during the past 40 years, but the efforts have fallen short.

"For 40 years, we have known about the relationship between sodium and the development of hypertension and other life-threatening diseases, but we have had virtually no success in cutting back the salt in our diets," said Jane Henney, chair of the IOM committee that wrote the report and professor of medicine at the University of Cincinnati College of Medicine.

Analysts estimate that a successful population-wide reduction in sodium could prevent more than 100,000 deaths annually.

Consequently, the IOM recommended that the Food and Drug Administration (FDA) take action to reduce the sodium content in food, but called for such regulations to take effect gradually. The goal is to slowly, over time, reduce salt in restaurant and processed food in a way that goes unnoticed by most individuals as their taste sensors adjust to the lower levels of sodium. Phased-in federal standards for the amount of salt that food manufacturers, restaurants, and food service companies can add to their products may make it easier for consumers to eat lower, healthier amounts of salt.

The FDA is currently reviewing the IOM's recommendations but has not yet made a decision to regulate sodium content in foods. An eventual FDA mandate to reduce sodium could have a positive effect on the health of individuals with kidney disease, potentially helping to mitigate their risk of developing heart disease.

Lower levels of salt in processed and restaurant food would likely help those on dialysis adhere to a low-sodium diet.

"Maintaining a healthy blood pressure is key to slowing the progression of CKD, but represents a challenge for many patients," said ASN Chronic Kidney Disease Advisory Group Chair Thomas DuBose, MD, FASN. "Making it easier for these individuals to reduce their sodium intake could help them make the lifestyle alterations they need to stay healthy and prevent requiring dialysis."

Health Policy Expert Nominated to Run Medicare and Medicaid

Donald M. Berwick, MD, pediatrician and health policy expert, was nominated by President Obama to serve as Administrator of the Centers for Medicare and Medicaid Services (CMS) last month. If confirmed by Congress, Berwick, co-founder, president, and chief executive officer of the Boston-based Institute for Healthcare Improvement as well as a professor at Harvard Medical School and the Harvard School of Public Health, would bring considerable expertise to the position.

Considered by many to be a pioneer in the field of health care quality and patient safety improvement, Berwick was appointed to serve on the Advisory Commission on Consumer Protection and Quality by President Clinton in the 1990s, and was instrumental in overhauling the United Kingdom's health care system. Berwick also chaired the National Advisory Council of the Agency for Healthcare Research and Quality (AHRQ) and is an elected member of the IOM.

The office of Administrator—vacant since 2006—will play a significant role in implementing health reform legislation, including reducing Medicare spending rates while expanding Medicaid coverage to millions more. The Administrator will also oversee formation of the new Centers for Medicare and Medicaid Innovation, tasked by the legislation with testing innovative payment and service delivery models including Healthcare Innovation Zones (HIZ) and the Patient-Centered Medical Home.

With intense pressure on CMS to control costs and improve quality, the job is well-recognized as challenging. Berwick enjoys support from numerous health care organizations including the American Medical Association and the American Hospital Association, and Democrats hope for a rapid confirmation. Yet in a Senate still deeply divided over health reform, he may face a difficult confirmation fight.

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