Athens Kidney Center
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RETURN SERVICE REQUESTED

HOW TO QUIT SMOKING

J.A. Simon, *Archives Intern Med*, 2011, helps summarize our present knowledge on treating tobacco addiction.

1. Smoking is common; too many young folks still smoke; everyone else is exposed to the smoker's waste matter (the analogy I like the most is comparing "second hand" smoke to having someone drink a keg of beer and then proceed to pee all over social acquaintances).
2. It is our duty as doctors to encourage and help our patients to quit smoking: this is the #1 preventable cause of early death, outstripping salt intake, obesity and use of seat-belts.
3. Smoking is tough (on the lungs and everywhere else), and quitting is even tougher; most smokers actually want to quit, but can't do it without help.
4. Follow a tested pathway incorporating the 5As of tobacco use/cessation: Ask (about tobacco use), Advise (on quitting), Assess (willingness to quit), Assist (in quitting), Arrange (follow-up).
5. Set a Quit Date: it helps to use a meaningful date, such as birthdays, anniversaries or emotional milestones involving patient, significant other or progeny.
6. Combination treatment works best: treat smoking just as you would treat severe hypertension or metastatic cancer or HIV.
7. Counseling by qualified specialists is best; other options are MD-delivered counseling or toll-free help-line 800-QUIT-NOW.
8. Drug treatment includes (a) nicotine replacement therapy (starting on Quit Date, either as long-acting transdermal patch at 7-21 mg/day x 8 weeks, slowly tapering off over 4-8 weeks; consider short-acting nicotine inhaler/lozenges/gum PRN for acute cravings; do not use in pregnancy, cardiac arrhythmias or soon after an acute coronary syndrome.
(b) varenicline starting 1 week to 1 month before quit date as 0.5 mg p.o. q daily x 3 days, increasing to 0.5 mg p.o. BID x 4 days, then 1 mg p.o. BID x 12-24 weeks; do not use concurrently with nicotine replacement therapy.
(c) bupropion SR starting 1-2 weeks before quit date as 150 mg p.o. q daily x 3 days, and doubling dose to 150 mg p.o. BID x 8-12 weeks; do not use in seizure disorders or concurrently with MAOIs.

GETTING TO GRIPS WITH HYPOMAGNESEMIA

Hypomagnesemia is common, but as serum Mg is not a component of "routine" chemistry panels, this disorder is often missed. Over 10% of hospital in-patients and over 50% of ICU patients are hypomagnesemic. Hypomagnesemia is almost always "secondary" to another pathology, usually medications (loop diuretics, tubulotoxic antibiotics/aminoglycosides, amphotericin B, digoxin, cyclosporin, cis-platin, chronic PPI use), excessive GI (magnesium-containing) fluid losses (prolonged N-G suction, chronic diarrhea, intestinal fistulas), malabsorbtion syndromes/GI resection or excessive renal excretion (alcoholism, osmotic diuresis/diabetic polyuria, CKD, chronic metabolic acidosis, hypophosphatemia, primary aldosteronism, primary hyperparathyroidism/hypoparathyroidism, "hungry bone" syndrome post-parathyroidectomy). Furthermore, as Mg is an intracellular cation, normal or near-normal serum levels might co-exist with profound tissue Mg depletion. Clinical features of hypomagnesemia are those of neuromuscular excitability, similar to findings in hypocalcemia (e.g. tetany, carpo-pedal spasm, Chvostek's sign, tonic-clonic seizures) plus choreoathetosis, tremors/fasciculations, profound muscle weakness (cellular energy is present as "active" Mg-ATP moieties) and "cerebellar" features of nystagmus, ataxia and vertigo. Additional findings include (concurrent) hypokalemia, (concurrent) hypocalcemia, prolonged QTc (and PR intervals), atrial fibrillation/SVTs and ventricular arrhythmias including PVCs/ventricular tachycardia. If in doubt about the presence of hypomagnesemia, patients with "normal" serum Mg may be screened with a Mg Tolerance Test: obtain baseline pre-treatment Mg/creatinine ratio; administer 2.5 mg elemental Mg/kg weight in 50 mL D5W over 4 hours; assay Mg/creatinine excretion over the next 24 hours (starting from onset of Mg infusion); calculate amount of retained Mg from infusate, >25-50% retention is consistent with hypomagnesemia:1 - [24 hr urine Mg] - [Urine Mg/creatinine ratio x 24 hr urine creatinine] x 100% >25-50% is diagnostic total Mg infusion.

POST-APOCALYPTIC POTASSIUM IODIDE THERAPY

The tsunami-triggered nuclear meltdown in northeast Japan has inspired lay concerns about possible radiation contamination in continental US- a very unlikely scenario- and a brisk internet trade in potassium iodide "futures". Let's review the science, courtesy of *Medical Letter*, 2011: oral KI given as 130 mg p.o. q daily (half this dosage is recommended for children/teenagers, and a quarter of this dose for infants under 3 years of age) is rapidly absorbed and concentrated by active transport mechanisms within the thyroid gland, where it competes with (and prevents internalization, organification and storage of) radio-iodine within the thyroid, being most effective when taken prior to radio-iodine challenge, but still effective if ingested within 6 hours of radio-iodine exposure. Treatment should be continued until exposure risk has receded, noting that radio-iodine can be inhaled as an aerosol or ingested upon entering the food-chain through contamination of surface water, edible vegetation or animals grazing off contaminated greenery. Children and pregnant women are at highest risk from radio-iodine post-exposure, resulting in high rates of thyroid cancer and regenerative nodules; on the other hand, inappropriate use of KI risks transplacental transfer of iodide in pregnant women resulting in fetal goiter/hypothyroidism, and in all recipients, there is a moderate risk of parotitis/sialadenitis, allergic dermatitis, and either hypothyroidism or hyperthyroidism. Also, you do not need to invest in KI "futures" just yet: the risk of contamination in America is low, and those living within 10 miles of any nuclear reactor will receive free KI supplies from the Nuclear Regulatory Commission, whilst those living within 20 miles are supplied free KI from FEMA (Federal Emergency Management Agency). Now, that's a heck of a job, Brownie!

ANOTHER ARROW AT RECURRENT UTIS

Based on the common finding that many women with recurrent UTI tend to have depleted vaginal lactobacilli, a double-blind, placebo-controlled study of intravaginal lactobacilli suppositories (Lactin-V) by Stapleton et al, *Clin Infect Dis*, 2011, showed a marked reduction in UTI recurrence. This study opens up a whole new field of endeavor for probiotics and hopefully provides a new strategy in overcoming the spread of antibiotic drug resistance.

the
SECOND OPINION

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FROM THE EDITOR

Despite all you might have heard about jobs, housing, fuel costs, quality of schools, foreign wars, social entitlements and nonesuch, the true economic fault-line of this age is still healthcare: how can we provide enough medical care to a growing (in more ways than one) population; who should provide it, and in what setting; how do we pay for it; how much of individual healthcare is reasonable, especially if sponsored by the commonweal? Largely unvoiced, but hedging in the argument from either side, is the philosophical riposte: is healthcare a right or a privilege?

Regardless of which side you happen to embrace in this all-consuming argument - with each side amply supported by history and personal circumstance - it is clear there will be no "middle-ground" sanctuaries of indifference. Indeed, with the echolalic refrain on the "R" word (R is for repeal) along the campaign circuit, I fully expect the 2012 Presidential election to default as a referendum on healthcare, despite our current obsessions about Romney's faith, Pawlenty's charisma, the Donald's comb-over, Newt's women, Sarah Palin's brains and Obama's mojo. On a purely economic level, the argument on healthcare ultimately boils down to cost: no nation can afford top-drawer health care for all her people, all the time, at any cost. And if we are going to have an adult conversation about universal healthcare, it is way past time to let grandma down from the attic. Those who desire universal healthcare but shun rationing (of one sort or another), are the same dreamers who swoon at rainbows but deplore thunderstorms. There is no pathway to paradise, without first giving up the ghost.

And there are, of course, those on the opposite end of the spectrum, who insist that healthcare should be a purely personal economic transaction: "cash and carry" medicine if you will, where treatment is predicated by the depth of your pockets rather than the seriousness of your ailments. To each as much as they can afford, without picking their neighbor's pockets. Oddly, those same proponents scarcely extend that wee bit of illogic to other matters of public subsidy.

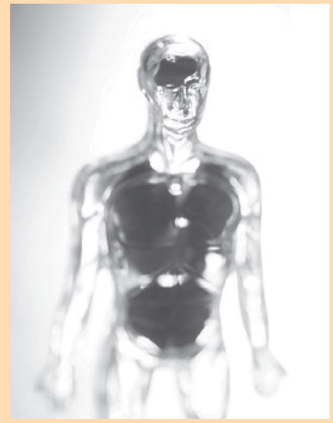
To be sure, there would always be a sizable minority, condemned by virtue of intransigent genes, a culpable environment, risque personal habits or perverse happenstance to an excessive consumption of healthcare resources, far beyond any obvious need or statistical entitlement. But that ought not be cause for undue hostility. Those lucky ones, who have no need for the stifling ministrations of our healthcare industry, should simply count their blessings. The rhetorical dissonance permeating the healthcare debate, is partly a proxy argument for other social misgivings, fostered by trying economic times and hijacked by voluble politicos. The bile on social entitlements neither reflects American civic values nor our reputation for being our brother's keeper.

Despite its ever-changing coloration as them-against-us politics, reinforced by political grandstanding and agitprop theater, this debate is more profoundly a plea to reform American medicine. At the heart of this rancorous conversation lies our discomfiture with runaway health costs, a near-invincible insurance industry and Big government: what is the role of government in a post-modern liberal economy?
Which is why doctors, who will be the main facilitators as well as beneficiaries of any lasting change in healthcare, ought to be full participants in this debate. This is no time to stay above the fray, sniffing at the labors of others, in the pretense that we already have the best of all possible worlds. The organized medical commentary on the debate thus far has been timid, reactionary and vacillating. We should, as a profession, be driving (and refereeing) this debate, staking out our grounds in the light of day, otherwise we forsake any right to criticism. The bystander role does not become us; the role of spoiler is even less appealing. One recalls the tale of Dimaragana the hunter, in Chinua Achebe's Things Fall Apart, who steadfastly refused to use his hunting knife to cut up dog meat on the grounds that dog meat was taboo to him, but then offered to use his teeth instead. Proof positive that humbug is no respecter of culture- or calling.

I'll see you Friday lunch-time, at the CME lounge. *Beze Adogu, MD, PhD, FACP*

THE END OF ALL STROKES

We all knew that stroke-related mortality had been dropping since 1980 (Rothwell et al, *Lancet*, 2004), age-adjusted stroke incidence has dropped since 1990 (Carandang et al, JAMA, 2006) and now, we have some evidence that the incidence of recurrent strokes has dropped by an average of 1% each decade since 1960 (Hong et al, *Circulation*, 2011). The reasons for the decline are less clear: within the same time span, tobacco use and average blood pressure levels declined, and anti-thrombotic drug treatment (and one supposes, age as well as obesity and prevalence of neuro-intensive critical care units) went up. In an accompanying editorial, Romano et al, *Circulation*, 2011, give reasons why we should not start popping champagne just yet.



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ANTIBIOTICS FOR APPENDICITIS

Inflammation of the vestigial appendix organ, irreverently tagged "acute lucrative appendicitis" by call-weary surgical interns of my day, remains the most common indication for surgery in an "acute abdomen". However, surgery-related morbidity, including spreading peritonitis and post-intervention adhesions/obstruction, can be substantial, especially in "complicated" appendicitis. In trying to identify safer alternatives, an open-label, randomized controlled French study by Von et al, *Lancet*, 2011, evaluates the use of antibiotics (amoxicillin plus clavulanic acid, i.e. Augmentin) in comparison to emergency surgery. Conclusion: oral antibiotics were comparable (sparing surgical intervention in 70% of cases), but were ultimately not "non-inferior" to surgery in "uncomplicated" cases (largely because a non-inferiority margin of 10% was chosen prior to patient randomization), and comes at a higher risk of recurrent symptoms requiring later surgery in 26%. Caveat: Augmentin was probably not the best drug for coliforms which are the pathogens usually associated with acute appendicitis.

FORGET NOT JUPITER

The JUPITER trial (Justification for Use of Statins in Prevention: An Intervention Trial Evaluating Rosuvastatin) by Ridker et al, *N Engl J Med*, 2008, established that "intermediate risk" patients (who were not previously treated with statins because their LDL cholesterol levels were under 130 mg/dL) who also had elevated levels of highly-sensitive C-reactive peptide and were placed on 20 mg rosuvastatin daily experienced a 20% reduction in all-cause mortality, 43% reduction in venous thrombosis, 47% reduction in need for coronary intervention (CABG or angioplasty) and 55% reduction in risk for first MI. JUPITER confirmed the benefits of aggressive statin treatment in at-risk patients (defined by 2 out of 3 factors: elevated serum LDL cholesterol, hs-CRP level >2 mg/dL, any 1 of "classic" Framingham CVS risk factors) and helped establish the new target of LDL cholesterol <70 mg/dL in those at higher CVS risk. Despite the focus of JUPITER being on rosuvastatin, it is the level of LDL cholesterol/hs-CRP reduction that is important, not the specific drug used.

RETROPERITONEAL FIBROSIS

Uncommon syndrome characterized by extensive retroperitoneal fibrosis, found 2x more commonly in males, and associated with smoking, asbestos exposure and HLA B27 and HLA DRB1 03 haplotypes. Etiology is obscure; current theory posits an autoimmune reaction to atheromatous plaque resulting in periaortitis, with regional infiltration by IgG4 lymphocytes and secondary polyclonal gammopathy.

Diagnosis is clinical: insidious onset of flank/abdominal discomfort associated with systemic symptoms (fever, weight loss, reduced appetite), acute phase response (manifested by high ESR), signs of distal lymphatic/vascular obstruction (pedal edema, hydrocele), and bilateral ureteral obstruction in most cases, often leading to renal failure; intravenous urography may show 1 of classic quartet of findings (delayed contrast excretion, bilateral hydroureters/hydronephrosis, medial deviation of middle third of ureters, tapering of ureter at L4/L5 vertebral level); CT imaging confirms retroperitoneal peri-aortic soft-tissue mass of homogeneous density extending from the renal arteries to iliac bifurcation, with/without medial displacement of both ureters.

Consider secondary retroperitoneal fibrosis: medications (methyldopa, practolol/beta-blockers, methysergide, ergot alkaloids); vasculitis/connective tissue disease (including lupus, Wegener's); local inflammation (post-surgery, post-radiation, trauma); granulomatous disease (lymphoma, sarcoma, tuberculosis, syphilis); fibrosing autoimmune disease (Riedel's thyroiditis, ankylosing spondylitis, inflammatory bowel disease).

Consider alternative diagnosis: CT imaging showing non-homogeneous mass with lateral ureteral displacement or anterior aortic displacement or bone invasion suggests (retroperitoneal) lymphoma; CT showing mesenteric involvement from soft tissue mass with adhesions/kinking involving small bowels suggests sclerosing mesenteritis; CT definition of intra-abdominal soft tissue mass typically in association with Gardner's syndrome suggests desmoid-type fibromatosis.

Treatment: surgical ureterolysis, glucocorticoid (steroid) therapy, azathioprine and other cytoxics/immunosuppressants.

AMINOGLYCOSIDE NEPHROTOXICITY

Up to 25% of ICU patients treated with aminoglycosides show evidence of nephrotoxicity, especially if at "added risk" from advanced age, pregnancy, history of underlying CKD, history of previous nephrotoxicity to aminoglycosides, extended duration/high dose of aminoglycoside treatment (as may be utilized for bacterial endocarditis), concurrent dehydration/acidosis or hyponatremia, concurrent hypothyroidism, concurrent liver disease/jaundice, and concurrent use of other nephrotoxins (especially IV contrast dye, NSAIDs, cis-platin, loop diuretics, cyclosporin, vancomycin and cephalosporin antibiotics). The best treatment is prevention!

MAKING SENSE OF ANGIOEDEMA

Angioedema is a fascinating but poorly-understood syndrome. Angioedema can occur as part of a generalized tissue reactivity and skin urticaria, or without urticaria. Patients typically present with facial/oral or labial edema, unexplained abdominal pain, upper airway obstruction or episodic dysphonia, or with other discrete subcutaneous tissue swelling. Non-urticarial angiodema may be hereditary or acquired. Hereditary angioedema is an autosomal dominant condition which often presents in the first or second decade of life, and is thought to arise from specific mutations of the C1 esterase inhibitor gene, which codes for a multi-functional serine protease inhibitor (C1 INH), that (a) inhibits the earliest components of the complement cascade, inhibits (b) Hageman factor XII in the classical coagulation cascade, and for full measure, also inhibits (c) kallikrein, which cleaves kininogen to form the autocoid mediator, bradykinin. Hereditary angioedema exists as 1 of 3 forms: type 1, where C1 esterase inhibitor is functionally normal, but at very low or undetectable levels; type 2 where C1 esterase inhibitor is dysfunctional, therefore measured levels are normal or even elevated, but functional activity is very low or undetectable; type 3, which is an estrogen-dependent variant with apparently normal C1 esterase levels and activity, and is thought to reflect mutations in factor XII (Hageman) gene. Acquired angioedema without urticaria exists as 1 of 2 types: type 1 is associated with other underlying medical diseases, typically B-cell lymphoma, and type 2 is an autoimmune condition with specific antibodies directed against C1 INH. The most common cause of acquired angioedema is ACE inhibitor treatment, particularly following enalapril therapy.

In most cases, the diagnosis of non-urticarial angioedema is often not considered, and typically not made at until after several years of needless ER visits and/or extensive evaluations, which may sometimes include emergent exploratory surgery. The underlying theme in non-urticarial angioedema is thought to represent high levels of tissue bradykinin from either uncontrolled tissue biosynthesis or impaired catabolism (by angiotensin converting enzyme). Diagnosis may be afforded by screening all unexplained non-urticarial angioedema for low/undetectable C4 complement levels before confirmation by demonstrating low/absent C1 esterase inhibitor activity.

Acute attacks of angioedema (in the hereditary form) may be provoked by emotional stress, tissue trauma or medical/dental procedures, and where those events can be reliably predicted, there is a role for short-term chemoprophylaxis using fresh frozen plasma or purified C1 esterase inhibitor or low-dose (attenuated) androgens such as oxandrolone/danazol. This syndrome is refractory to anti-histamines, steroids or subcutaneous epinephrine, though those futile interventions are still commonly employed in acute care settings. New drugs for this potentially life-threatening disorder currently under development include icatibant (bradykinin receptor antagonist), ecallantide (a kallikrein inhibitor which blocks bradykinin synthesis) and recombinant C1 esterase inhibitor. Acquired angioedema secondary to ACE inhibitor therapy shows a strong racial bias, being more common in Blacks for still unclear reasons, though this is now believed to be due to genetic polymorphisms affecting alternative catabolic pathways for bradykinin, such as aminopeptidase P.

KNOW YOUR ENTEROTYPE

It turns out we are 1 of 3 distinct biologic "enterotypes", based on the endogenous microbial flora of our intestines, as reported by Arumugam et al, *Nature*, 2011. Using newly sequenced fecal metagenomes from subjects in 4 different countries, 3 major enterotypes of Bacteroides (type 1), Prevotella (type 2) and Ruminococcus (type 3) were identified. Those enterotypes appear to be remarkably resilient, were not geography/country-specific, and largely immune to diet, environment or therapeutic manipulation. It is speculated that the ecology of those endogenous bacteria could predetermine some of our own (host) traits such as nutritional status, vitamin deficiency, obesity and general health status.

HOW (NOT) TO USE IV ALBUMIN

Since publication of the SAFE trial (Saline versus Albumin Fluid Evaluation: Finfer et al, Safe Study Investigators, *N Engl J Medicine*, 2004) routine use of IV albumin for fluid resuscitation in the ICU setting has deservedly regressed. Yet, as with most medical conundrums, the devil is really within the details of current clinical use. The biologic effects of albumin, including its well-recognized impact on intravascular oncotic pressure, as well as the less widely appreciated anti-inflammatory and anti-oxidative properties, appear to be situation-dependent and dose-related. Specific situations where IV albumin might be advantageous in comparison to crystalloids (such as isotonic saline) include:

1. Severe sepsis with hemodynamic collapse (Safe Study Investigators, *Intensive Care Medicine*, 2011; Delaney et al, *Crit Care Med*, 2011) where IV albumin couild improve survival, with an odds ratio of about 0.82 compared to IV saline.
2. Sustained hypoalbuminemia with serum albumin <2.5 g/dL (Dubois et al, *Crit Care Medicine*, 2006).
3. High risk of pulmonary edema, such as in capillary leak syndrome, diffuse interstitial pneumonitis, severe lung barotrauma, etc (based on an extant study by Rackow et al, *Crit Care Medicine*, 1983, which demonstrated that ICU patients receiving starch or albumin were less likely to develop pulmonary edema compared to those receiving saline infusions).
4. Hepato-renal syndrome, advanced liver cirrhosis (particularly in the context of spontaneous bacterial peritonitis and large volume abdominal paracentesis), and during liver transplant surgery (Gines & Arroyo, *Gut*, 2000).
5. There are anecdotal reports of albumin superiority in IV fluid resuscitation of burns patients

A recent study using a murine model of endotoxemia by Kremer et al, *Crit Care Medicine*, 2011, provides timely evidence that timing and dosage of albumin administration are of critical importance in determining outcome in sepsis.

PLATELET-RICH PLASMA: QUESTION MARK IN SPORTS MEDICINE

Platelet-enriched plasma is derived from centrifugation of whole blood, wherein cellular components of plasma is separated, being particularly endowed with high platelet counts and multiple serum-derived growth factors. There are several anecdotal and animal studies, backed up by few human case reports suggesting that platelet-rich plasma could facilitate wound healing, thereby allowing earlier resumption of active sports following injury. Now comes 2 well-designed, double-blind randomized trials by de Jonge et al, *American J Sports Med*, 2011 in chronic Achilles tendinopathy, and by Schepull et al, *American J Sports Med*, 2011 on acute Achilles tendon rupture. In both studies, platelet-rich plasma did not confer any advantage on wound healing, and might actually be detrimental to healing of acute Achilles tendon rupture as suggested by lower tendon rupture scores in recipients. Users should recognize that parenteral administration of growth factors, such as IGF-1, is banned by the US Anti-Doping Agency and treatment with platelet-rich plasma is considered equivalent to "growth hormone doping". Furthermore, as with some autologous blood products, active infections, dyscoagulopathy, metastatic cancer, hypersensitivity to bovine thrombin and pregnancy are relative contraindications to its use.

MEDICAL TREATMENT OF KIDNEY STONES

Kidney stones are a common condition, with a global prevalence of between 2-20%, highest in the Middle-East and much lower in Far East, whilst in the United States there is a high prevalence in the South-East and low prevalence in the North-West. Most stones are composed of calcium oxalate, the remnant containing calcium phosphate, uric acid, struvite (triple Ca-Mg-Ammonium phosphate) or cystine. Stone formation is predisposed by male gender, occupation (high amongst restauranteurs and commercial vehicle drivers), genetics/family history, dietary calcium intake (extremes of intake- high or low- increase risk), hypercalcemic disorders (especially primary hyperparathyroidism and chronic immobilization), urinary stasis or infection, and chronic intestinal disease. Medical interventions to reduce risk of recurrent stone formation:

1. Adequate fluid intake to maintain urine output over 2 liters/day.
2. Adopt low salt diet.
3. Reduction in oxalate-rich foods (nuts, spinach, beetroot, soya beans, tofu, okra, yams, chocolate, rhubarb, peanut butter, sesame seeds).
4. Stop any drugs associated with stone formation: loop diuretics (Lasix), excessive vitamin D/calcium treatment (milk-alkali syndrome), triamterene, HAART (especially lopinavir and indinavir).
5. Increased dietary potassium/magnesium intake, or by adding p.o. supplements of both cations.
6. Dietary citrate supplementation as K or Mg-containing salt (even if patient has "normal" urine citrate levels) or alternatively using K or sodium bicarbonate, designed to attain fasting urine pH >6 (excessive alkalinization with urine pH >7 may increase the risk of calcium phosphate stones but is often required for cystine stone management).
7. Reduced dietary fat (reduces urinary oxalate excretion), reduced animal protein (reduces urinary urate excretion), reduced beer intake (reduced urate formation), increased vegetable/fruit intake (alkalinizes urine/reduces urine urate excretion).
8. Thiazide diuretics (to reduce urinary calcium excretion).
9. Allopurinol (to reduce uric acid formation).
10. Pyridoxine (vitamin B6) supplements are effective in primary hyperoxaluria type 1 only.
11. Cystine chelation with Thiola/tiopronin (alpha-mercaptopropionylglycine) or D-penicillamine.
12. Antibiotics are indicated for struvite stones, adding acetohydroxamic acid (Lithostat) in severe or refractory disease.

COGNITIVE DYSFUNCTION IN DIALYSIS PATIENTS

A timely review by Tamura & Yaffe, *Kidney International*, 2011, explores the wasteland of cognitive dysfunction within the ESRD population. Though found in 16-38% of renal failure patients, this syndrome remains very poorly understood, seldom identified by clinicians, and rarely treated. Indeed, not only can the clinical differentiation of dementia from depression and/or delirium be problematic, it further impedes clinical care of CKD and imposes an associated toll on long-term health outcomes. Those at highest risk include the aged/elderly, less educated, low socio-economic status, and patients with vascular risk from chronic hypertension, diabetes mellitus or dyslipidemia. Other risk factors include intradialytic hypotension, dialysis disequilibrium syndrome, cerebral edema, hyperviscosity syndromes, thrombophilia, chronic anemia, vascular calcification, hyponatremia, chronic under-dialysis, persistent proteinuria and inflammation/oxidatve stress. Treatment for dementia in ESRD has been extrapolated from the non-renal population; cholinesterase inhibitors (i.e. tacrine, donezepil, galantamine and rivastigmine) or MMDA receptor antagonists (Memantine) are the first-line agents.

WHO COULD HAVE THOUGHT THAT?

Cardiac patients are not the most compliant of folks- at least, so their cardiologists say (they haven't met nephrology patients yet!) As the armamentarium against coronary artery disease (CAD) expands, so has therapeutic drug non-compliance. Dunlay et al, *Mayo Clin Proc*, 2011, report that poor medication adherence to beta-blockers, statins, ACE inhibitors/angiotensin receptor blockers (which are all very expensive drugs, by the way) is influenced by medication costs. I suspect any of their patients could have told them that.

MEANINGFUL USE OF NEPHROLOGY FOLLOW-UP

1 out of 9 adults in the USA (23+ million people) suffer from chronic kidney disease; those with CKD are predisposed to early cardiovascular morbidity as well as progression to end-stage kidney failure. Our CKD population is also disproportionately elderly, diabetic, hypertensive, small-for-date at birth and impoverished. There are only so many practicing nephrologists (about 4,500 adult specialists) in America. How do we triage and re-focus scarce resources for those CKD patients at highest risk for progression to end-stage renal failure? Peralta et al, JAMA, 2011 helps by showing that renal progression is best predicted by confirming CKD using a "triple marker" approach, where all 3 screening tests (i.e. serum creatinine, serum cystatin C, and urinary albumin/creatinine ratio) were used to screen for CKD. Those CKD patients who were "triple marker-positive" were 100x more likely to develop ESRD than those with isolated serum creatinine elevation. Another paper by Tangri et al, JAMA, 2011, describe a predictive model based on age, sex, eGFR, albuminuria, serum bicarbonate, serum albumin, serum calcium and serum phosphate to identify a CKD cohort that would reliably progress to ESRD. These markers are soon coming to a practice near you.