Vitamins D3 and K2—The Dynamic Duo
by Ron Hunninghake, MD

Every fall, leading into winter, the sun sets further and further into the south. The days get shorter and the sun’s rays diminish in duration and intensity. This is when D3—“the sunshine vitamin”—blood levels drop in sun-exposed mammals.

That imperceptible signal results in profound behavioral changes that are easily observed in foxes, bears, and many other land roaming creatures: their activity slows while their foraging increases. They are fattening up their calorie stores for the long winter’s hibernation.

With the advent of spring, the bright summer sun’s UVB rays once again bathe their skin and fur. This is where abundant D3 is synthesized from the photo-transformation of cholesterol. This hormone-like vitamin slowly absorbs into the blood stream where it is delivered to the liver, then to the kidneys, where it is finally converted into the activated form of vitamin D.

Rising levels of activated D signals renewed growth, heightened metabolic activity, better immunity, sharpened reproductive instincts, and accelerated tissue repair/regeneration. For millions of years, rising vitamin D levels were synonymous with health, healing and vitality in our mammalian relatives.

Recalibrating Vitamin D Standards
In contrast, my medical school training taught me only that vitamin D prevents rickets. Very small doses were all that was required to keep young kids from having weak, rubbery bones. “Feed ’em vitamin D2 fortified milk and the kids will be fine.” These small doses did stop the spread of endemic rickets.

Because vitamin D is a fat soluble vitamin, the medical standard, until recently, was limited to only 400 IU (International Units) per day. The fear was that an excessive intake of vitamin D would build up in the fatty tissues of the body, possibly leading to excessive calcium absorption and toxicity. “Hypercalcinosi” might then result in the formation of kidney stones, calcified arteries, and other manifestations of excessive calcium in the urine, blood, and body tissues.

Is vitamin D more a drug than a nutrient? This question evokes the famous Paracelsus quote: “The dose makes the poison.” Rodenticides are pesticides that kill rodents, such as rats, mice, and yard destructive moles. Most readers are aware that Coumadin is a carefully dosed medical blood thinner that, when used at the higher pesticide dosages, kills rodents.

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It will probably come as a very big shock for our Health Hunters readers to learn that vitamin D3—cholecalciferol—is also used as a rodenticide! That's right, vitamin D3, if given in a high enough dose over a short enough period of time, effectively kills rodents through massive hypercalcinosis of their organs.

That fact sheds a whole new light on why many "old school" vitamin D researchers are very wary of patients "getting carried away" with their ultra high doses of vitamin D3 as a modern cure all. Is vitamin D3 really the superhero nutrient ready to "save the day"...or could it be the malevolent evil-doer secretly disguised as a "good guy"!

**Putting Safe D3 Dosing in Perspective**

Up until recently, the highest dose of vitamin D3 we typically recommended at the Riordan Clinic was 50,000 IU as a convenient once a week dose. Our maximum daily dose was 5,000 IU. This is a very safe dose as is documented on the website of the Vitamin D Council. (www.vitamindcouncil.org) Children can safely take about 1000 IU for every 25 lbs. of body weight.

That information may not seem reassuring now that the reader knows that vitamin D3 is used to kill rats. But here's the data on the LD50 of vitamin D3—the Lethal Dose to kill half of the animals tested: Rats—42 mg/kg, Dogs—88 mg/kg.

Because an accurate LD50 for cholecalciferol in humans has never been determined (thank God!) most researchers use the LD50 for dogs as an estimate for humans. Using a hypothetical human subject weighing 110 pounds: in order to reach the LD50 dose, that subject would need to consume over 3,500 of the 50,000 IU D3 caps in a 24 hour period (146 capsules an hour) in order to have a 50% chance of dying.

I think we're all safe! (It is actually 10 times easier to kill yourself by over consuming water than it would be by overdosing on vitamin D3 capsules.) **Author's note:** I actually had a patient who took too many capsules of various and sundry supplements...and developed a gelatin bezoar that obstructed his small intestine! Don't overdo capsules!

Of course there are other toxicity and sensitivity issues that can arise in the human consumption of vitamin D3. Generally these can be avoided by having your 25(OH)D level measured once a year and keeping it around 60 ng/dl for optimal health.

Keep in mind that we evolved from primitive, naked humans who lived near the equator, and who, like swimming pool life guards, got around 10,000 IU of D3 from the sun on a regular basis. Canadian researcher Dr. Reinhold Vieth has studied the question of D3 toxicity extensively and states categorically that there is no published evidence for this causing toxicity in adults taking 10,000 IU of a daily D3 supplement.

**Why Bother Taking Supplemental D3?**

The following chart is taken from the Vitamin D Council's website where the reader will find extensive documentation for how vitamin D3 can be of benefit for those who have or are at risk of having the following health conditions:

<table>
<thead>
<tr>
<th>Anaphylaxis</th>
<th>Endometrial cancer</th>
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<tr>
<td>Anemia</td>
<td>Esophageal cancer</td>
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<tr>
<td>Asthma</td>
<td>Fibromyalgia</td>
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<tr>
<td>Autism</td>
<td>Gastric cancer</td>
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<tr>
<td>Breast cancer</td>
<td>HIV and AIDS</td>
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<tr>
<td>Cervical cancer</td>
<td>Hypertension</td>
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<td>COPD</td>
<td>Inflammatory bowel dis.</td>
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<tr>
<td>Colorectal cancer</td>
<td>Influenza</td>
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<td>Congestive heart failure</td>
<td>Lung cancer</td>
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<tr>
<td>Coronary artery disease</td>
<td>Melanoma</td>
</tr>
<tr>
<td>Dental caries</td>
<td>Multiple myeloma</td>
</tr>
<tr>
<td>Depression</td>
<td>Multiple sclerosis</td>
</tr>
</tbody>
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**Osteopenia**

- Ovarian cancer
- Pancreatic cancer
- Parkinson's disease
- Periodontal disease
- Pneumonia
- Preeclampsia
- Prostate cancer
- Renal cancer
- Rickets
- Sepsis and septicemia
- Type II diabetes
Nutritional Support for Anxiety and Stress: A Patient Profile
by Chris Brannon, RN

Having severe stress and anxiety can be more than just an obstacle to overcome; they can be completely overwhelming and interfere with your everyday life. Would you want to be in a dormant lifestyle, avoiding social situations and daily activities, or live life to its fullest? One of our patients chose to conquer her fears and not allow stress and anxiety to control her.

This patient, a 51 year old female, came to our clinic to seek advice and expertise from our doctors. After extensive nutrient testing and listening to the patient to get to the roots of certain stressors, a plan of action was chosen. The plan incorporated several supplements, including NiaPlex, Niacinamide, 5-HTP, hormone replacement therapy, as well as IV vitamin C (Mini Myers IV twice a week).

In just a month’s time, the patient is now able to take part in social situations and not get overwhelmed and accomplish daily activities without feeling overworked. She is now also able to drive a vehicle again and not feel as though she is an unstable driver. Getting her life back into balance has helped this patient take control and live an active life!

Would Even Higher Doses of D3 Make Sense?
Given the over 56,000 published studies on the benefits of vitamin D3 when dosed optimally in humans, it only makes orthomolecular sense to wonder if higher doses might be of greater benefit in chronically ill patients.

The real question here is "What is an optimal dose?" Orthomolecular medicine is defined as "using the correct dose, of the right molecule, for the right condition, in the appropriately chosen patient."

At the Riordan Clinic, we are using this orthomolecular approach in our application of vitamin D3 in the care of patients suffering from sustained illnesses as delineated on the previous page. However, we don’t just dole out vitamin D3 in a reckless manner. We use several principles of care and safety that were highlighted during Dr. Riordan’s life and tenure at the clinic:

1. **Patients as co-learners.** Our patients are encouraged to read and be responsible and self-educated about their illness and the orthomolecular treatments they are using. We provide extensive info on vitamin D3.

2. **Identify and treat actual causes.** Rather than temporarily mitigating symptoms, this approach actively searches for and corrects underlying and sustained causes, such as vitamin D deficiency.

3. **Characterize biochemical individuality.** Measuring baseline vitamin D levels accomplishes two goals: diagnosis, plus the ability to verify correction of a deficiency later on when progress is being assessed.

4. **Care for the whole person.** Taking even the best vitamins at the optimal doses is never enough to maintain the "whole person perspective" in true health care.

5. **Let food be thy medicine.** Modern medicine may not even know about small amounts of phytonutrients that only whole foods can provide.

6. **Cultivate healthy reserves.** During challenging times of stress and illness, key nutrient reserves may get depleted. Plus, nutrients always work as a team.

7. **The healing power of nature.** The doctor treats, but nature heals.

Max D3:K2—The Birth of a Superhero Combo
Speaking of team work, vitamin D3’s natural partner is vitamin K2. The genius of this combo begins with proper respect for D3’s function of powerfully enhancing calcium absorption. Recent research has shown that excessive calcium intake alone can be harmful to the body. The additional calcium must be correctly utilized or it can show up in the wrong places and cause disease.

This is how very high doses of cholecalciferol kills rodents: excessive calcium uptake, deposition, and interference with normal cardiac and renal function. By conscientiously using vitamin K2 in conjunction with D3, this issue of "metastatic calcium" is thoroughly avoided.

Vitamin K2 activates several important proteins in the body. Henrick Dam, a Danish researcher, discovered vitamin K in 1939 (and won the Nobel Prize for his discovery in 1943). Because the Danish word for blood clotting was koagulation, Dam named the molecule vitamin K. Vitamin K is essential for the functioning of eight proteins involved in blood clotting.

Vitamins D3 and K2—The Dynamic Duo continues on page 4...
A major medical misunderstanding surrounds vitamin K. Most doctors believe that vitamin K "causes" coagulation. It is true that babies born deficient in K need injections of it to restore coagulation. It is also well known that Coumadin, another rodenticide, poisons vitamin K coagulation function which does cause thinning of the blood. At really high doses this can kill a rat. At properly controlled doses, it can dissolve a threatening blood clot in a human patient.

The correct understanding is that vitamin K, through a chemical step called carboxylation, REGULATES and balances the coagulation system as a whole. Keep in mind that the coagulation system stands ready to CLOT if you are hemorrhaging to death, but it must also PREVENT THE CLOT if there are no lacerations or bleeding points. The eight proteins counter-regulate one another in this balancing act. Vitamin K is needed for this amazing feat.

Carboxylation of osteocalcin is another regulation feat of vitamin K which keeps bones properly mineralized with a strong protein matrix. Activated osteocalcin also stimulates adiponectin, a potent fat metabolism stimulator which helps people maintain normal weight. It is believed that all the antibiotics used in animal feed lots these days are finding their way into consumer’s guts where the beneficial bacteria that convert vitamin K into its active form are being badly disrupted. (Hence, low vitamin K in the body may be a contributing factor in the modern obesity epidemic!)

Activation of the vascular GMP protein is crucial in preventing calcification of coronary and carotid arteries. This explains the 50+% reduction in heart disease in regular vitamin K users. This same protein may also prevent bone spurs. Vitamin K is thus helping us age better with "hard bones and soft arteries"...not the other way around.

Finally, like vitamin D3, strong evidence demonstrates vitamin K’s amazing ability to reduce cancer risk. For example, men taking vitamin K2 mk7 (a naturally occurring long acting form of K2) at 45 mcg a day can statistically reduce their risk of prostate cancer by 60%! That is just one of many cancer risks that are reduced significantly by regular K2 ingestion.

As we explore the healing power of higher doses of vitamin D3 at the Riordan Clinic, we have found it prudent to partner the safety and effectiveness of this dynamic duo. For every 5,000–10,000 units of D3 being recommended and tested for, we are recommending 100 mcg of K2 mk7 to be sure and prevent the inappropriate calcification that higher doses of D3 alone could cause.

In fact, we have authorized the production of a Riordan Clinic private label combo: "Max D3:K2"—a supplement that will marry the amazing healing capacity and safety of these two powerhouse supplements into the convenience of one capsule containing 10,000 IU of D3 with 100 mcg of K2 mk7. Be sure and talk with your Clinic doctor to see if you are an appropriate candidate for its use when it arrives this November.

Bio-Center Laboratory at the Riordan Clinic can test your vitamin D levels. Call 316-682-3100 to set up your lab appointment. Cost: $108
Iodine, the Thyroid and Breast Health
by Mike Bauerschmidt, MD

October is breast cancer awareness month. Below Dr. Bauerschmidt divulges important information about breast health and steps you can take to avoid harmful toxins.

After the thyroid, the breast is the second largest user of iodine. Scientific evidence connects inadequate dietary iodine with higher instances of breast cancer. Japanese women, who consume an average of 14 mgs of elemental iodine daily, have the lowest prevalence of breast and reproductive cancers in the world.

In the US, bread was a daily source of sufficient iodine until the 1960’s because the industry used iodine as a dough conditioner in bread and baked goods. At that time, breast cancer risk in the U.S was one in 20 women. Due to bromine being cheaper and easier to come by, it has been substituted for iodine by the food processing industry. Since then, the breast cancer rate has steadily risen in the US, and statistics now show that 1 in 8 women will get invasive breast cancer in their lifetime. Early detection is secondary only to prevention.

Compounding the Problem
In addition to bromine, our exposure to fluorine and chlorine also conspire to interfere with iodine absorption and thyroid function. Iodine, bromine, fluorine and chlorine are all in the same halide family in the periodic table of elements, meaning that they all share similar chemical structures and actions. In the body, chlorine, bromine and fluorine displace iodine in the thyroid hormone and in the tissues. Your exposure is widespread and daily, from your morning shower to your computer:

Increased consumption of and exposure to bromine, chlorine and fluorine causes complications because they all displace what little iodine you do have, further lowering tissue iodine levels. Why is this so important? Because the thyroid gland needs iodine for proper functioning, which involves producing thyroxin (thyroid hormone) to drive the body’s metabolism. Iodine also stimulates the metabolism of the more potent estrogens estradiol and estrone into weaker estriol, which increases your cancer protection. When there is sufficient iodine in your system, bromine, chlorine and fluorine are eliminated from your body.

Not Just for Women
The prostate contains thyroid hormone receptors; therefore iodine is also important for prostate health. While hypothyroidism is more common in women than in men, we are seeing more cases in men.

Iodine and Breast Health continues on page 6...
Opportunities for Substantial Gifts

I am writing this not only to recall various events and decisions I have made over the past many years, but also, and this is more important, to have this be an encouragement to you as both life and financial decisions are made. I continue giving to charities much of what has been entrusted to my care and stewardship. Being charitable and supporting worthwhile causes has been a consistent pattern in my life. The Lord has blessed me immensely. Because of this, I have established an estate plan that will continue my stewardship legacy with the resources God has entrusted to my care. I am explaining…so that it might be an encouragement for all of you to establish your own legacy and be charitable with what the Lord has provided.

—Former patient

This gentleman chose to invest in the future of the Riordan Clinic with a charitable gift annuity. His wishes were that his family and friends also leave a legacy of support for the causes they believe in.

There are a variety of planned giving options, including two simple options that allow tax incentives now while investing in the work of the Riordan Clinic.

In a bequest through a will, you do not surrender ownership during your lifetime, only after others have been provided for. You may designate a dollar amount, property, a percentage of the estate or the remainder.

A gift of life insurance enables you to make a tax deduction in the year of the gift, generally close to the surrender cash value of the policy. You may name the Riordan Clinic as beneficiary to receive all or a portion of the proceeds.

To learn more about these charitable giving options, please contact Paula Smith at the Riordan Clinic:
316-682-3100 or at psmith@riordanclinic.org.

What Can You Do?
Remove the offending chemicals wherever possible. Use filters to remove chlorine from drinking water and showers. There are ionizers that can attach to pool filters that reduce the amount of chlorine required. We have one on our pool filter and hot tub.

Look for breads without “potassium bromate.” Substitute sprouted grain breads as they don’t contain bromine. Eat organic fruits and vegetables as much as possible, and be particularly aware of non organic strawberries as they are commonly sprayed with methyl bromide.

Before beginning an iodine supplementation program, be aware that your thyroid may become enlarged or tender. It has likely been deprived of the nutrient for so long that it may want to store extra. This symptom will usually pass with time or with a slight reduction in dosage. It is best if you work with a physician who understands thyroid physiology and can help guide you on a path to your best breast health and thyroid function.

Natural Methods to Boost Vitamin D

by Laurie Roth-Donnell | Master Herbalist and Holistic Health Practitioner

“Three out of four Americans suffer from low levels of vitamin D. African-Americans and Hispanics show particularly high risk—nearly all suffering with suboptimal levels.”—according to Dr. Adit Ginde, an assistant professor of surgery at the University of Colorado, Denver School Of Medicine. Vitamin D deficiency can also be caused by inadequate exposure to sunlight, combined with poor diet and malabsorbed supplements.

Why Do We Need Vitamin D?
Vitamin D is critical for strong bones by assisting in the absorption of calcium from food. In older adults, a daily dose of D and calcium helps to prevent fractures and brittle bones. Children need D to build strong bones and prevent rickets, a cause of bowed legs, knock knees, and weak bones. By simply supplementing this vitamin to milk in the 1930s, the disorder was nearly eliminated. To build strong bones and prevent rickets, a cause of bowed legs, knock knees, and weak bones. By simply supplementing this vitamin to milk in the 1930s, the disorder was nearly eliminated.

According to the Mayo Clinic, research has indicated that vitamin D may protect against high blood pressure, osteoporosis, cancer and some autoimmune diseases.

How to Identify Your Current Level of Vitamin D:
The most accurate way to measure how much vitamin D is in your body is the 25-hydroxy vitamin D blood test. A level of 20 nanograms/milliliter to 50 ng/mL is considered adequate for healthy people. A level less than 12 ng/mL indicates vitamin D deficiency. Ask your primary care physician to assist you with this test or search online for home tests.

How Does the Sun Give Us Vitamin D?
By simply supplementing this vitamin to milk in the 1930s, the disorder was nearly eliminated.

Natural Methods to Boost Vitamin D continues on page 7...
It is important to know the purpose of your supplements. Before starting any supplement regimen consult your physician.

Vitamin D 2,000IU Softgels  
$9.48 Sale $8.06 (VVD2)

Solar D Gems 4,000IU Softgels  
$15.38 Sale $13.07 (VVD4)

Vitamin D 5,000IU Capsules  
$18.22 Sale $15.49 (VVD5)

Vitamin D 1,000IU per DROP  
$15.95 Sale $13.56 (VVDLiq)

Vitamin K2 MK-7  
(Menaquinone-7)  
$18.98 Sale $16.13 (VVK7)

Vitamin K2 (Menatetrone)  
$22.25 Sale $18.91 (VVK)

Vitamin D3—K2MK7 Emulsion  
$16.96 Sale $14.42 (VVDK)

Iodoral 12.5mg  
$27.51 Sale $23.38 (Vlod)

Iodoral 50mg  
$30.92 Sale $26.28 (Vlod50)

Breast Cancer, Vitamin D, and a Dose of Sunlight. Lunch and Lecture Video with Dr. Hugh Riordan and Dr. Ron Hunninghake  
$14.95 Sale $12.71 (AV2719)

COMING in NOVEMBER:  
Max D3:K2 120 CAPS  
$34.24 Sale $29.10

Pre-order and pay in October and receive 15% off our new supplement.

of vitamin D is compromised. It has also been noted that older people and those of darker skin tones have lower production levels, and experts say it’s better to rely on food and supplements. Some assorted fish, such as salmon, swordfish, or mackerel, provide a healthy amount of vitamin D in one serving. Other fatty fish such as tuna and sardines have some D, but in much lower amounts. Small amounts are also found in egg yolk, beef liver, and fortified foods like cereal and milk. All are great unless you suffer from fat malabsorption syndrome.

VITAMIN D LIGHT STUDY:  
Individuals with fat malabsorption syndrome cannot efficiently absorb vitamin D from the diet. According to a study published by the National Institutes of Health, an alternative method to raise vitamin D levels, especially during the winter months when vitamin D cannot be made, is to expose the skin to UVB by a device that allows the body to produce vitamin D3 cutaneously.

Vitamin D Light Therapy  
Light therapy involves getting out in the sun every day or spending time each day under special light therapy bulbs. These bulbs are very bright, with 5000 lux (a measure of light levels) or more. Check online for more details on these lights from manufacturers around the world.

Best Time to Schedule Light Therapy  
Light has benefits any time of the day. However, light therapy obtained in the morning is believed to have slightly more benefit.

Effects of Too Much Light  
Overexposure to sunlight and UV rays may cause skin cancer, cataracts or macular degeneration. Too much artificial bright light may trigger mania in people with bipolar disorders, or anxious feelings in healthy people.

When I relocated from Southern California to the state of Washington, I began feeling an ache in my bones. My primary care physician ran a full screen blood workup on me that indicated a vitamin D deficiency. I began a daily regime, which included an oral supplement and a 30-minute Full Spectrum Light Therapy session daily. I am pleased to report that my vitamin D level has returned within the normal range.

If you want to learn more about your vitamin D level, please consult your primary care physician and may the sun always shine on your face!

References:  
www.webmd.com  
www.lighttherapyoptions.com  
www.ehow.com/facts-vitamin-light-therapy

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In Gratitude:
As a not-for-profit organization, we rely on many to make our vision a reality. So many come together to provide our patients with a place of hope, health and happiness. Here are just a few we’d like to thank.

- All individuals and groups who have donated to our cause through financial support
- Sedgwick County Early Childhood Coalition Council for room rental and your interest in our work
- Our patients, co-learners, and staff who spread the good word about the clinic:

  “...thank you all for a wonderful first appointment! My husband and I were blessed by everyone’s kindness! We left there so hopeful and encouraged.” —S.C. 9/12/13

Check Your Health: Review Your Lab Test Results

**Presenters:** Dr. Charles Hinshaw Jr., Dr. Jennifer Kaumeyer, Dr. Anne Zauderer

**When:** Thursday, October 31, 2013
12:00 p.m. to 1:00 p.m.

**Cost:** FREE—Lunch is not included.

Riordan Clinic doctors will discuss laboratory results from the September Check Your Health event. You can participate in the lecture in two ways:

1) Bring your Check Your Health test results to the lecture and follow along as the doctors offer an explanation for some of the key measurements.

2) If you didn’t take part in the event but want to learn more, we will provide you sample test results to use as a learning tool during the lecture. Follow along with the doctor’s comments.

Check Your Health laboratory tests results provide a guide to supplementation and dietary nutrition to optimize your health. Come to this lecture to learn how you can benefit.

This lecture will not be available via the Internet live webcast.

**Reservations REQUIRED**

Call 316-927-4723 or email us at reservations@riordanclinic.org

Check Your Health: Review Your Lab Test Results

Lunch and Lectures: A Look Ahead...

**November 14, 2013**
Conquering the Super Bugs (and how ultraviolet light may play a role) with Dr. Jennifer Kaumeyer. $10. 12–1pm.

Call 316-927-4723 to reserve your spot for any of the above lectures or email reservations@riordanclinic.org.

Dates, topics and titles are subject to change. Reservations required.

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