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Vitamin D Screening and Supplementation

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Family Medicine Clerkship March/April 2016

UVM Medical Center - South Burlington Family Medicine

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Problem

- ▶ Vitamin D helps protect against osteoporosis (by promoting calcium absorption), moderates cell growth, aids in neuromuscular and immune function and reduces inflammation.
- ▶ No national primary care professional organization currently recommends screening for vitamin D deficiency.
- ▶ There is insufficient data to assess the balance of benefits and harms of screening for vitamin D deficiency according to The American Academy of Family Physicians.
- ▶ In 2007, 85% of people in central Vermont were vitamin D deficient.
- ▶ There is confusion over what constitutes vitamin D deficiency.
- ▶ There is mixed evidence and recommendations for testing vitamin D levels, supplementation efficacy such as reduction of fractures, cardiovascular disease, cancer and mortality.
- ▶ There is no current standard laboratory test for vitamin D.

Public Health Cost

- ▶ Sales of vitamin D have reached \$550 million in 2010 compared to \$40 million in 2001.
- ▶ Pending insurance, 25(OH)D testing can range from free to \$300.
- ▶ 25(OH)D lab orders increased 6 fold between 2004 and 2008 in the United States.
- ▶ Medicare spent \$224 million on 25(OH)D testing for seniors in 2011.
- ▶ \$14 billion was spent on osteoporosis related fractures in 2012.
- ▶ Vitamin D supplements may be covered by insurance if patient is severely deficient. The cost is dose dependent and ranges from approximately \$5 to \$30 per 100 capsules.

Community Perspective

- ▶ Interview with Kimberly Evans, MS, RD a clinical dietitian for the University of Vermont and co-owner of Whole Health Nutrition

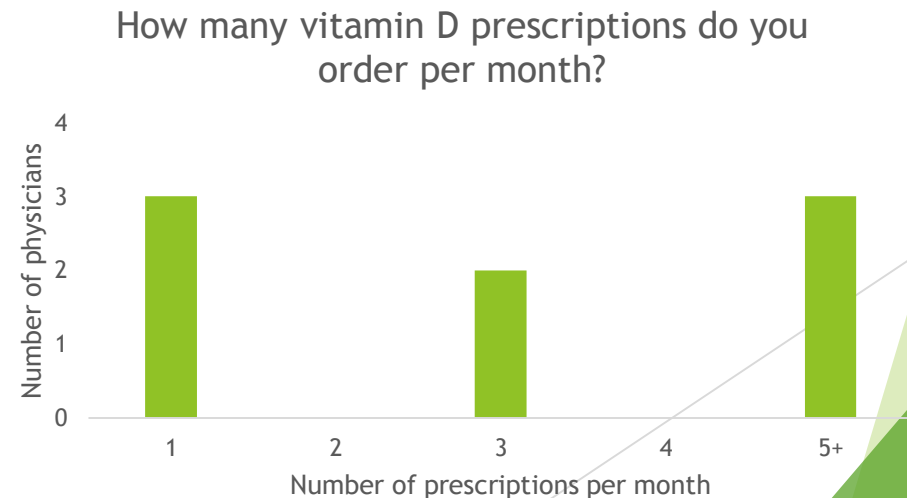
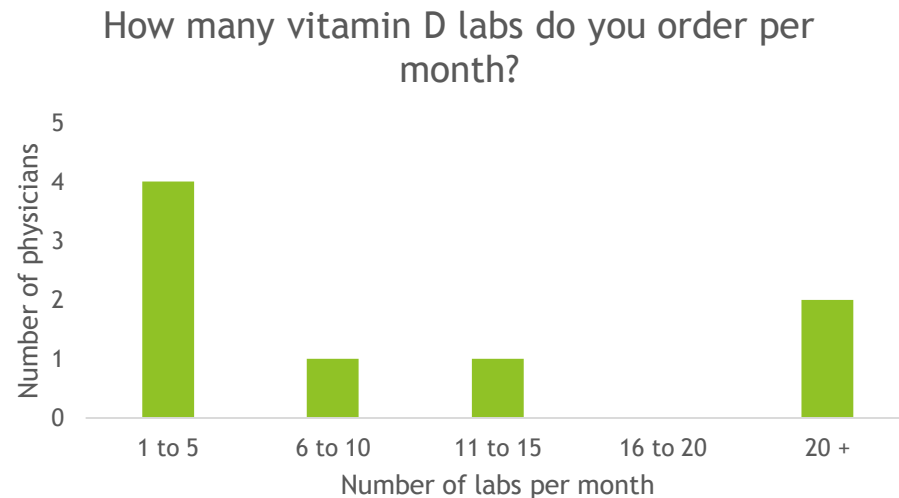
“...50% of our patients are deficient in Vitamin D. We generally test all of our patients. Most critical are obese patients, anyone presenting with depression, eating disorders, athletes, Hashimoto's or other autoimmune disease. Teens and folks who spend lots of time indoors or covered in sunblock we recommend testing as well.”

- ▶ Interview with [Unnamed Patient] at South Burlington Family Medicine

“I was diagnosed with cancer a couple years ago. I decided to try an anti-inflammatory diet and saw a naturopath. My vitamin D levels were low and so I was put on supplements to try to decrease my inflammation. I think living in Vermont a lot of us are deficient and don't even know it.”

Community Perspective and Support

- ▶ A survey was distributed to physicians at South Burlington Family Medicine.
- ▶ 87.5% (n=8) of physicians surveyed agree that they prescribe vitamin D for treatment only (not prevention).
- ▶ 75% (n=7) of physicians surveyed agree that more patients are asking about vitamin D.
- ▶ Reasons for ordering labs varied among providers. Responses included lack of sun in VT, vague symptoms needing a diagnosis and patients with malabsorption, osteoporosis, fatigue, dark skin or obesity.
- ▶ Physicians responded to the following questions:



Intervention and Methodology

► Intervention:

Physicians at the South Burlington Family Medicine identified a lack of information available to their patients and families regarding vitamin D. As there are no recommendations for vitamin D screening, many physicians saw benefit in making an informative vitamin D flyer and revising the current patient handout. Both interventions focused on importance of vitamin D, sources, at-risk populations, signs of deficiency and toxicity.

► Method:

Conduct a literature review on vitamin D including screening, guidelines, supplementation and at risk populations. Review patient educational materials available in office and interview providers. A concise, easy to read patient friendly flyer was developed. The previously available patient handout was revised and updated.

Results

- ▶ The physicians at South Burlington Family Medicine were enthusiastic to have an informative flyer and revised vitamin D handout that could be easily read by patients and family members.
- ▶ A flyer with current recommendations and information was provided to South Burlington Family Medicine.
- ▶ A revised vitamin D handout was given to providers.
- ▶ Electronic copies of both the flyer and handout are available to staff for future use.
- ▶ Providers showed interest in completing the survey and were surprised by the variability in responses.

Results

UVM Medical Center Patient Instructions - Learning About Vitamin D

Why is vitamin D important?

Your body needs vitamin D to absorb calcium. Calcium keeps your bones, muscles and heart, healthy and strong. If you don't get enough vitamin D throughout your life, you have an increased chance of developing osteoporosis. This means your bones may break easily. In children, they may not grow properly or rickets may develop. Rickets is weak bones.

Vitamin D can also boost your immune system, reduce inflammation and may prevent cardiovascular events.

Vitamin D and calcium are added to many foods. Your body can also make vitamin D from sun exposure.

How much vitamin D do I need?

Age	Amount
0-12 months	400 IU
1-70 years	600 IU
>70 years	800 IU

International Units (IUs)

Where can I find vitamin D in my diet?

Food	IUs per serving*	% DV**
Cod liver oil, 1 tablespoon	1,360	340
Swordfish, cooked, 3 ounces	566	142
Salmon (sockeye), cooked, 3 ounces	447	112
Tuna fish, canned in water, drained, 3 ounces	154	39
Orange juice fortified with vitamin D, 1 cup (check product labels, as amount of added vitamin D varies)	137	34
Milk, nonfat, reduced fat, and whole, vitamin D-fortified, 1 cup	115-124	29-31
Yogurt, fortified with 20% of the DV for vitamin D, 6 ounces (more heavily fortified yogurts provide more of the DV)	80	20
Margarine, fortified, 1 tablespoon	60	15
Sardines, canned in oil, drained, 2 sardines	46	12
Liver, beef, cooked, 3 ounces	42	11
Egg, 1 large (vitamin D is found in yolk)	41	10
Ready-to-eat cereal, fortified with 10% of the DV for vitamin D, 0.75-1 cup (more heavily fortified cereals might provide more of the DV)	40	10
Cheese, Swiss, 1 ounce	6	2

* IUs = International Units.

** DV = Daily Value.

What makes me at risk for vitamin D deficiency?

Some people do not make vitamin D as well as others from the sun and may require vitamin D supplements.

Things that may reduce how much vitamin D your body makes include:

- Dark skin
- Age older than 65 years
- Obesity
- Low sun exposure
- Digestive problems, such as Crohn's, cystic fibrosis or celiac disease
- Liver and kidney disease

What are signs of deficiency?

Signs of vitamin D deficiency include fatigue, muscle pain, weakness.

Blood tests for vitamin D can check your vitamin D level. However, there is no standard normal range used by all laboratories. The Institute of Medicine recommends a blood level of 20 ng/mL of vitamin D for healthy bones.

Are there risks from too much vitamin D?

You should not consume more than 4,000 IU daily. Side effects of high vitamin D are related to increased calcium in the blood. Symptoms may include nausea, vomiting, constipation, or weakness. Excessive urine output, kidney stones or an irregular heart rhythm may also occur.

Vitamin D may interact with other medicines. Tell your doctor about all of the medicines you take, including over-the-counter drugs, herbs, and pills.

Please contact your doctor with any question or concerns.

What is vitamin D?

Vitamin D helps absorb calcium and keeps your bone, muscles and heart strong.

May prevent diabetes and hypertension

How do I get vitamin D?

Our body makes vitamin D from sun exposure 5 to 30 minutes twice a week

Salmon, tuna and mackerel (best)

Cheese, egg yolks and beef liver

Fortified foods and drinks

Supplements



VITMAIN D



What are signs of deficiency?

Muscle cramps, weakness, fatigue, chronic pain, headaches and depression may be signs of low vitamin D levels.

What are signs of too much?

Nausea, constipation, confusion, abnormal heart rhythm and even kidney stones from high calcium.

Stay below 4000 IU per day.



How much do I need per day?

Birth to 1 year: 400 IU

1 to 70 years: 600 IU

71 and older: 800 IU

Over 75% of Americans have low levels of Vitamin D

Am I at risk for deficiency?

If you have dark skin, are older than 65, have digestive problems (such as Crohn's and Celiac disease), are obese, or have liver or kidney disease you may be at risk.

Several medicals interfere with vitamin D's production or use.

Questions or concerns?

Please ask your provider.

Evaluation of Effectiveness and Limitations

- ▶ The flyer will fill a gap in patient education and improve physician-patient discussions regarding vitamin D because of an increase in awareness and knowledge.
- ▶ Accessing vitamin D deficiency is difficult because it may be treated over the counter.
- ▶ This project was completed in early Spring. Winter is when most physicians and patients are concerned about vitamin D deficiency.
- ▶ A chart review should have been performed comparing vitamin D tests and supplementation prevalence before and after the flyer and handout were available to evaluate effectiveness of the interventions.
- ▶ The flyer will be competing with other patient materials in the office. There are numerous patient handouts for various conditions.
- ▶ Both interventions assume the patient is literate in English.
- ▶ The time restraint does not allow a follow-up period to evaluate effectiveness.

Recommendations for future interventions

- ▶ Increase number of survey responses and types of providers (internal medicine, pediatrics, specialists).
- ▶ Survey more patients for their prospective and perceived knowledge.
- ▶ Compare yearly vitamin D labs and supplementation rates in various geographic areas.
- ▶ Assess dietary recommendations of vitamin D based on age and co-morbidities.
- ▶ There are multiple clinical studies currently assessing the effectiveness of vitamin D.

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Interview Consent Form

Thank you for agreeing to be interviewed. This project is a requirement for the Family Medicine clerkship. It will be stored on the Dana Library ScholarWorks website. Your name will be attached to your interview and you may be cited directly or indirectly in subsequent unpublished or published work. The interviewer affirms that he/she has explained the nature and purpose of this project. The interviewee affirms that he/she has consented to this interview.

Yes _____ / No _____