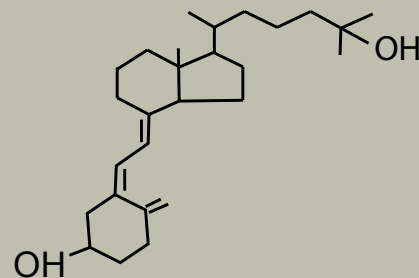


Mystery Molecule

This molecule has been in the news because of problems assaying it at a commercial laboratory as well as Medicare considering not paying for its measurement. Can you guess what it is?



Answer: Vitamin D - Pictured is 1,25-dihydroxy-vitamin D. The indications for ordering this test remain controversial, but there is no question that vitamin D has become a major analyte in recent years.

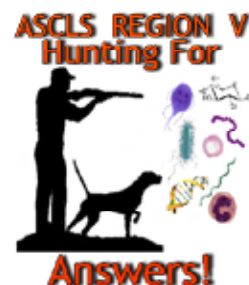
Mystery Molecule reprinted with permission from www.AACC.org

Mark Your Calendars!

ASCLS Region V Meeting
October 14-16, 2009
Watertown, S.D.

Ramkota Hotel & Event Center
Meeting contact: Mona Gleysteen
at GLEYSTEM@lakeareatech.edu

Avera Laboratory Network will have a hospitality suite at the Ramkota after the final session on Oct. 14, 2009.



Website Catalog Update:

We are improving our online lab catalog to provide customized test information for each region. It will also allow clinical laboratory professionals to make updates that are immediately available to the end-user. All tests performed by ARUP will automatically receive hot list updates electronically, creating efficiencies in the process. Avera Sacred Heart Hospital Laboratory was the first to go live with the new format in July. Avera Queen of Peace and Avera St. Luke's will be on-line by the end of August and Avera McKennan will begin the process later this year.

3900 W Avera Drive
Sioux Falls, SD 57108

Avera St. Luke's Hospital, Aberdeen
Avera Queen of Peace Health Services, Mitchell
Avera McKennan Regional Lab, Sioux Falls
Avera Sacred Heart Hospital, Yankton

Avera
Laboratory Network

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Lab Links

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Regional Response. Personal Results.

VITAMIN D – WHY ALL OF THE HOOPLA?

Vitamin D is a fat-soluble vitamin that is naturally produced by the body upon exposure to sunlight. Recently, so much has been written and published regarding the value of vitamin D supplementation, concentration and assay by experts and by non-scientists, that we have much confusion and misinformation regarding this important vitamin. Hopefully this article will help clarify the issue.

Let's look at some very basic information.

- Vitamin D exists in two forms, D2 and D3.
- The D2 forms are derived from plants and yeast material that have been irradiated with UVB (ultra violet B) rays. This form is only obtained through supplementation in foods and in designated vitamin formulations.
- The D3 forms are produced by exposure to sunlight, but also are present in foods and supplements, although most United States supplements are in the D2 form.

The biologically active form of vitamin D is 1, 25 hydroxy

Vitamin D. It is derived from the D2 and D3 forms through a series of consecutive hydroxylations primarily in the liver and kidneys. Neither the D2 nor D3 form of the native vitamin is biologically active. It is the metabolite that has the activity.

In a temperate climate area like South Dakota, a 30-minute sunlight exposure in the summer can produce up to 20,000 International Units (IU) of vitamin D3. However, sun-blocking agents dramatically reduce this. In the fall and winter months for areas north of 35 degrees latitude, a line from South Carolina to Los Angeles there is insufficient UVB radiation to trigger vitamin D3 production in adequate quantities. As a result, dietary supplementation is critical. Additionally, other factors influence the levels of Vitamin D produced. The following all affect the rate of vitamin D production:

Age: Older people manufacture less vitamin D.
Pigmentation: Increased melanin reduces production.
Clothing: Covering the skin reduces exposure.
Sun screen: The lotion blocks the UVB rays needed.

How Much Do I Need?

Presently, the recommended daily intake (RDI) for vitamin D is 200 IU per day. This amount is highly disputed. This RDI was based on anecdotal observations from more than 40 years ago on rickets prevention in children. The Institute of Medicine currently is doing a study to determine optimal levels of vitamin D intake. Many investigators feel that the RDI should be as much as 10 to 20 times higher in order to maintain adequate levels of active metabolite. The recommended level of 25(OH) D is >30 mg/ml, and studies indicate that about 75 percent of Americans do not meet this level. In fact, 90 percent of Mexican-Americans and 97 percent of African-Americans do not meet this level. There are few, if any, studies on Native Americans on vitamin D levels. Tanning-bed exposure will produce similar levels of vitamin D as direct summer sunlight exposure for a comparable amount of time.

Testing Methodologies

The issues with vitamin D testing methodologies have caused more heartburn in

Continued on page 2

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Vitamin D

Continued from page 1

laboratory circles than anything else. Originally, vitamin-D assays were very complex and time consuming. Among some of the newer technologies used are immunoassays, radio immuno assay (RIA - DiaSorin), chemiluminescent immunoassay (DiaSorin Liaison), HPLC (ESA) and LC-MS/MS. Lately, Quest Laboratories had serious issues with the normal values for their LC-MS/MS method. The chemiluminescent assay is FDA-approved and the most widely used method. It uses the same antibody as the original RIA. Recently, an HPLC method (ESA) received approval from the FDA. It is important to understand that the population-based reference ranges vary by methodology, ethnicity, age, geographic location and the sampling season. Some authorities recommend using ranges that represent clinical-decision values for males and females of all ages, rather than population-based reference ranges.

Clinical Relevance

A number of human body tissues have been identified as possessing vitamin-D receptors. Among the major tissues

are brain, heart, skin, bone marrow, prostate, reproductive tissues, breast, GI tract and immune cells, including T & B cells as well as activated lymphocytes. As a result, vitamin-D status affects diseases such as:

- Multiple sclerosis
- Diabetes
- Hypertension
- Asthma and severe allergies in children
- Celiac disease
- Crohns disease
- Bone disease
- Periodontal disease

Many of the above-mentioned diseases have or are believed to have an immunologic component. It is known that the immune system learns most of its "lessons," and how to recognize foreign antigens and respond, between conception and age 2. Much of the inutero recognition is mediated by dendritic cells. Vitamin D has a strong effect on dendritic cells, which direct the immune response to behave with a given tolerance to a cell or protein. If vitamin-D levels are inadequate, an intolerance can be triggered. Thus, if inadequate levels of vitamin D are present in late-term pregnancy or early

infancy, the immune system may not develop a tolerance for a variety of normal proteins and cells in the body.

There are many ways to ensure infants receive their needed amounts of vitamin D. In many tropical countries, it is common for infants and young children to be exposed to direct sunlight for short periods of time several times a day. In Finland, it has been customary for many years to administer cod liver oil, one or two tablespoons, which contains up to 20,000 IU/tablespoon, daily to all infants through their first year of life to prevent rickets. Cod liver oil is very high in vitamins A and D as well as Omega-3 fats. A recent study in 2001 showed that children who took cod liver oil had an 80-percent lower risk of developing juvenile diabetes, and children with vitamin-D-deficiency rickets were three times more likely to develop type 1 diabetes.

In short, we all need some exposure to the sun without sun block, but not so much that we burn. We also need to ensure we are getting supplementary vitamin D. The sunshine vitamin truly is one of our best friends.



REGIONAL SERVICE CENTER SPOTLIGHT

Each quarter, one of our regional service centers will be featured in a "Regional Spotlight." In this issue, we are sharing information on the Avera Queen of Peace Laboratory.

In June 2009, Avera Queen of Peace Laboratory implemented Atlas at Dr. Tjarks' clinic in Mitchell and at Jerauld County Clinic in Wessington Springs. Atlas is a connectivity tool that enables Avera Queen of Peace Laboratory to interface, via a web-based browser, with referring physicians through online order entry and test results.

This interface will assist in a reduction in turnaround times and specimen-handling errors, improve productivity and enhance client communications. Timely, accurate results are now sent directly to the physicians' desktops resulting in improved patient care and customer satisfaction.

AVERA
QUEEN OF PEACE
LABORATORY

HEY MEDICAL LABORATORY TECHNICIAN, IS ARTICULATION FOR YOU?

Are you a busy, dedicated clinical laboratory technician (CLT)/medical laboratory technician (MLT) who would love to further your education, but you don't have the time or money to go back to school? Well then an articulation program might be for you. A list of CLT/MLT to Clinical Laboratory Science (CLS)/Medical Technology (MT) articulation programs can be found on the scientific assembly page of the ASCLS website, http://www.ascls.org/leadership/Docs/ASCLS%20Online%20Directory_CLT.doc. Requirements vary from program to program. Some require more on-campus time than others. Clinical experience is done at an approved site. There are several programs available from facilities in our region.

The University of Nebraska Medical Center offers CLT to CLS classes online. No on-campus time is required. The program will take from two to five years. Admission requirements and application can be found at <http://www.unmc.edu/alliedhealth/cls/bscls/apply.htm>. This program is designed for working professionals.

The University of North Dakota also offers online classes. For students with a minimum of three years of experience, all classes are available online. For students with less

experience, select online classes are available. On-campus time is dependant upon work experience. With a minimum of three years experience, the student may be eligible for a one-week intensive laboratory on-campus course. Other students are required to take a 12-week summer practicum. The length of the program depends on the student's experience. For more information see <http://pathology.med.und.nodak.edu/cls>.

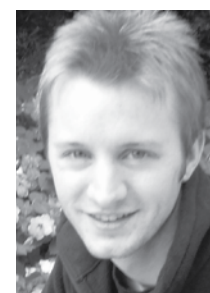
Several South Dakota, Minnesota and Nebraska facilities are affiliated with Weber State University in Ogden, Utah, where the program is designed for working technicians with at least three years of job experience. Upon application, a statement of support must be submitted from the student's employer. Once the student is accepted, a legal affiliation is arranged between the sponsoring facility and the school. More information can be obtained at <http://weber.edu/cls>. Program length depends on the class load taken by the individual student and the number of credits transferred to the program.

"An investment in knowledge always pays the best interest." –Benjamin Franklin

CENTER STAGE



Bernie Reddy, MLS (ASCP), at Avera St. Luke's, was selected as the ASCLS 2008 Member of the Year for South Dakota and was one of 14 nominees for the 2008 National Member of the Year. Bernie's contributions to the profession of Medical Laboratory Science include promoting laboratory sciences through health fairs, career fairs, NMLW activities and coordinating student activities during their clinical internship. She's been an inspiration to others as an active member in the ASCLS organization and was recognized at the National ASCLS Convention in Chicago for her achievements. Congratulations, Bernie!



Michael Woolheater and Shirley Heber of Avera McKennan Regional Laboratory were elected to the board of the South Dakota chapter of the American Society for Clinical Laboratory Science (ASCLS-SD) at the April 28, 2009, ASCLS-SD spring meeting. Shirley and Michael also received state-level Omicron Sigma awards in recognition of their volunteer service in the profession of Clinical Laboratory Science in ASCLS.



Shirley Heber, MS, MT (ASCP), was added to the outreach team as a consultant for Avera McKennan Regional Laboratory in May 2009. Shirley has a Bachelor of Science in Medical Technology from South Dakota State University and a Master's in Administrative Studies from The University of South Dakota, along with more than 30 years of experience in laboratory management. Shirley is a member of the South Dakota Board of Directors for American Society of Clinical Laboratory Science (ASCLS), and currently serves as state ASCLS secretary-treasurer and co-editor of state ASCLS newsletter, *Volution*.



Lezlee Koch of Avera McKennan Regional Laboratory received a national-level Omicron Sigma award for her dedication to ASCLS and Clinical Laboratory Science.