Faculty/Staff Fitness (FSF) PROGRAM

Blood Draw Test Information Packet

Registration/Questions: 123 Langton or by phone 737-3222

Tests offered:

I. Lipid Profile: $22.00
II. Combination Lipid/Multi-Chem: $32.00
III. PSA (prostate): $25.00
IV. TSH (thyroid): $25.00
V. B12 (bone density): $22.00
VI. Hemoglobin A-1C (diabetes): $17.00
VII. hs-CRP (inflammation, re: heart disease): $32.00
VIII. Iron Panel (complete iron profile): $17.00
* IX. Vitamin D: $50.00
PREPARING FOR THE BLOOD CHEMISTRY PROFILES

The following suggestions are intended to insure meaningful, accurate measurements from your blood samples.

1. Fast 12-14 hours prior to your scheduled time.
2. Water consumption during the fasting period is permissible (or coffee/tea without cream or sugar).
3. Drink at least one eight-ounce glass of water prior to giving blood. This is to replace fluid loss due to urination and other natural processes.
4. **DO NOT** workout or exercise vigorously 24 hours prior to the draw.
5. **DO NOT** make dietary changes from your normal routine between now and when you arrive to the test.
6. If time permits, arrive early so you can sit and relax for 5-10 minutes before your sample is taken.
7. Test results will be available in about a week and will be sent to you by the FSF office.

TEST PRICES

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LIPID PROFILES

Measurements of total cholesterol, HDL “good” cholesterol, LDL “bad” cholesterol and triglyceride levels.

MULTI-CHEM SCREENS (i.e. Biochemical Profiles)

A group of test performed on a single blood sample (a tablespoon of blood). Each test measures a chemical component that must remain within rather narrow limits for the body to function properly. A profile tests a variety of systems such as hepatic (liver), renal (kidney), cardiac (heart), and endocrine (secrating internally). It may aid in the detection of specific disease such as diabetes mellitus, gut, or hepatitis. An abnormal result can indicate a problem but further study will be required in order for a diagnosis to be made. Three premises underlie the development of periodic screening procedures: 1) that asymptomatic adults can harbor organic disease; 2) that periodic screening can detect such diseases at an early stage; and 3) that early discovery of disease can lead to its arrest, reversal, or cure.

PSA (prostate specific antigen)

A cancer test for males; PSA, which is normally secreted by the prostate, increases the amount when cancer begins to form. The PSA test is far from perfect; it can yield false positives or false negatives. Still, according to many experts, the PSA test is a most useful cancer marker if used along with the normal physical palpation exam by a physician. A separate small blood sample is required for the PSA.

THYROID FUNCTION

The TSH (Thyroid Stimulating Hormone) Test is utilized for detecting an underactive or overactive Thyroid. It is estimated that 40% of the American population suffer from Hypothyroidism. The American Thyroid...
Association recommends testing for all adults every 5 years beginning at age 35 with a simple blood test for TSH. About 12% of American adults have undetected thyroid problems (mostly Hypothyroidism). **Symptoms of Hypothyroidism include** – weight gain, fatigue, constipation, cold sensitivity, depression, impaired memory loss, decreased sex drive, headaches, hoarseness, dry skin and dry thickening skin. **Symptoms of Hyperthyroidism include** – trembling, heart palpitations, anxiety, sleeplessness, loss of weight and depression. Also, there is the potential of fatal heart rhythm abnormalities and osteoporosis.

**BONE DENSITY AND VITAMIN B12**

While women are about 4X more likely to develop weak, porous, osteoporotic bones, men can also suffer a decline in bone strength over time. A recent study has linked low bone mineral density in both men and women with Vitamin B12 deficiency, although the mechanism behind the relationship isn’t fuller understood. The researchers examined Vitamin B12 status and indicator of bone health in 2,576 men and women aged 30-87 who rare participating in the Framingham Osteoporosis Study.

Participants with plasma levels of Vitamin B12 below 148 Pico moles per liter (pM/L) were found to beat greater risk for developing osteoporosis than those with higher levels. Some experts consider plasma B12 levels below 185 pM/L to be “very low.” The recommended daily allowance for B12 is currently 2.4 micrograms for both men and women.

**DIABETES INDICATOR**

With the pre-diabetics and diabetics on the rise in the US, the Hemoglobin A-1C test is now added to our “shopping list” of biochemical screens. The Hgb A-1C provides an indication of how well blood sugars are controlled in the past 120 days.

**Hs-CRP**

Having an ever present, low-grade inflammation throughout the body is associated with heart disease, stroke and diabetes. One of the best measures of this is CRP. Dr. Paul Ridker, a leading CRP researcher, estimates that between 25-30 million healthy middle-aged Americans have normal cholesterol, but above-average CRP’s, putting them at an unusual risk of heart attacks and strokes! CRP is potentially becoming a better predictor of heart disease than cholesterol!!

**IRON**

Screening for iron deficiency and overload, a potentially fatal condition that wreaks havoc on nearly every major organ in the body, isn’t a routine practice in most doctors’ offices. But researchers at Rochester General Hospital in New York State, who recently tested 16,000 people for the condition, are saying it should be. In fact, based on their findings, lead investigator Pradyumna Phatak, MD, said that, “at the very least, all white people should be screened with a blood test, once, in their twenties or thirties.” Iron overload, or hemochromatosis, is most common among Caucasians, especially those of northern European descent. The Centers for Disease Control and Prevention disagree, recommending that only high-risk groups, such as immediate family members of people who have hemochromatosis or those with early symptoms of the disease, get tested.

But **iron overload is the most common genetic disorder in this country**, affecting as many as one in every 200 people- which makes it many times more common than better-known genetic diseases, including cystic fibrosis, Huntington’s disease, and muscular dystrophy. Moreover, those in favor of widespread screening argue that it’s a powerful way to save lives. “If you catch it early enough, your life expectancy is completely normal, because treatment for hemochromatosis is so easy and effective,” says Dr. Phatak. “But if you let it go, the consequences could be severe: cirrhosis of the liver, heart damage, diabetes, impotence, even degenerative arthritis.” What happens is that hemochromatosis throws off iron metabolism in such a way that the body absorbs too much of the mineral from foods. Since there’s no way to flush out the excess, iron floods the system, depositing
itself in organs like the liver, heart, joints, and pancreas. In its early stages, when people are in their 20s and 30s, the condition is often easily ignored-or mistaken for other illnesses-because the symptoms, such as fatigue or aches and pains in the joints, are so vague. But if the disease progresses unchecked, by the time someone reaches his or her 40s or 50s, the growing iron deposits damage and eventually destroys surrounding tissues, leading to organ failure and chronic disease.

Fortunately, treatment for iron overload, once it’s diagnosed, is simple: blood-letting, or phlebotomy, to help rid the body of excess iron and thereby stop any tissue damage in progress. Because iron is found in red blood cells, the blood contains a large portion of the body’s stores. Blood is drawn frequently—about one pint a week until iron storage levels are reduced to normal and three or four times yearly thereafter.

*VITAMIN D*

Our bodies can make Vitamin D only when our skin is exposed to sunlight under the proper conditions. This production is dependent on the season, where we live, and time of day. People in Northern climates (above 35 degrees N Latitude) have insufficient sun exposure particularly from October–March. This seasonal deficit is compounded by avoiding sun exposure during spring and summer, and the use of sun screens.

A growing number of scientists who study Vitamin D levels in human populations now recommend *annual* blood tests to check Vitamin D status. Cancer prevention specialists at the U of California suggest taking 1000 IU of Vitamin D daily. The current RDA is 400 IU daily while many experts now advise at least 800 IU daily. Elderly adults may benefit from higher doses such as 2000 IU and even up to 5000 IU daily. Sunshine (enough time to just start a sunburn) can be the equivalent to an oral vitamin intake of 10,000 IU.

*Life Extension – May 2007*
*Alternatives – Dr. David Williams. April 2007. Vol. 11 #27*
*Health Gems News by Melissa Wilson, MS and Susan Carlson, RPh. Vol. 1 # 2. 2006*

**Understanding Your Lipid Profile**

Total cholesterol measures the sum of all forms of cholesterol. Because total cholesterol is a mixture of “Bad” (low-density lipoprotein, or LDL cholesterol) and “Good” (HDL) cholesterol, it is important to know the specific lipoprotein fractions if the total cholesterol level is greater than 200mg/dl.

Ratios comparing these lipid measures help fine-tune heart disease risk. These include:

1. Total cholesterol divided by HDL cholesterol (ideally under 5.5, with risk of heart disease climbing as the number increases).
2. LDL divided by HDL (ideally less than 3.5, with risk climbing as the ratio rises).
3. Triglyceride level divided by HDL cholesterol (ideally under 4, with the risk clearly beginning at 5 and climbing as the number increases).

The effects of HDL and LDL on the risk for heart disease are independent. Thus if HDL levels are very high, this helps offset the risk associated with LDL cholesterol. On the other hand, in some instances, even when the total amount of LDL is not high, the amount of beneficial HDL is too low (a condition called isolated low HDL cholesterol). Even in the absence of other risk factors for heart disease, this finding alone is enough to warrant concern and a recommendation for lifestyle modification.
The following is a summary of Lipid levels:

**Total Cholesterol**
- **Desirable:** Less than 200mg/dl
- **Borderline:** 200 – 239
- **Too high:** More than 240

**HDL Cholesterol**
- **Desirable:**
  - Men: More than 45mg/dl
  - Women: More than 55mg/dl
- **Borderline:**
  - Men: 35 – 45
  - Women: 40 – 55

**LDL Cholesterol**
- **Desirable:** Less than 130mg/dl
- **Borderline:** 130 – 159
- **Too high:** More than 160
- **Too low:**
  - Men: Less than 35
  - Women: Less than 40

**Triglycerides**
- **Desirable:** Less than 100
- **Borderline:** 200 – 400
- **Too high:** More than 160
- **Very high:** More than 1,000

**Triglycerides/HDL**
- **Desirable:** Under 4

**LDL/HDL Ratio**
- **Desirable:** Less than 3.5
- **Too high:** More than 3.5


### Expert Panel Calls for Lower LDL Levels

**Target LDL Levels.** Finding from five major trials of cholesterol-lowering drugs prompted an expert panel from the National Cholesterol Education Program to revise some of the target levels for low-density lipoprotein (“bad” LDL) cholesterol (some are unchanged):

- Below 70 – for certain people at very high risk
- Below 100 – for those at high risk (with established heart disease)
- Below 100-130 – for those at moderate risk (multiple risk factors)
- Below 160 – for those with zero or one risk factor

The updated criteria, reported in the July 13 *Circulation*, means many more people will be prescribed statin drugs, but that does not change diet advice.

**Diet, Exercise Still Crucial.** Lifestyle changes remain key to lowering LDL’s, whether or not you are on statins:

- Maintain a desirable body weight
- Eat plenty of fruits and vegetables
- Include whole grains, legumes, lean protein sources and low-fat or nonfat dairy foods.
- Include fatty fish twice a week
- Limit saturated and trans fat
- Exercise a minimum of 30 minutes at moderate intensity (e.g., brisk walking) most (or all) days of the week.
See your doctor to determine your risk (or visit www.nhlbi.nih.gov and click “Health Assessment Tools” then “10-Year Heart Attack Risk Calculator”).

**Avoiding Aging**
**A reason for the TSH blood test!**

TSH (Thyroid Stimulation Hormone) A test for Hypothyroidism. Located in front of the neck, just below the Adam’s apple, the thyroid gland regulates the body’s metabolism. If the thyroid doesn’t produce enough hormone, just about every bodily function slows down.

So….

**If you are experiencing any of the following conditions-the TSH test might be worth your consideration:**
* Feeling lethargic
* Feeling depressed
* Feeling confused
* Aching muscle or joints
* Easily chilled
* Sleep Apnea
* Hearing loss
* Possible Anemia
* Possible increase in blood cholesterol

Hypothyroidism sends out so many signals it is often mistaken for other conditions or simply overlooked.

Treatment is nearly as simple as diagnosis—a daily pill to replace the missing thyroid hormone.

Source: By Marvin M. Lipman, M.D. A Certified Endocrinologist and Metabolism Specialist; an Emeritus Professor of Medicine at New York Medical College.

**THE THYROID TEST (TSH)**

If the thyroid gland fails to produce enough hormone, you can gain weight, experience memory and hair loss, feel tired all the time, and have trouble sleeping— all symptoms of HYPOTHYROIDISM. On the other hand, HYPERTHYROIDISM is—too much hormone production (usually affecting younger women). You might experience reduced menstrual flow, irritability, anxiety, sleep disturbances, tremor, weight loss, eye irritation, heat intolerance, and suppressed fertility.

Thyroid disorders can also be the site of benign or malignant growths, but thyroid cancer is relatively rare.

It may be hard for a doctor to spot thyroid problems: the symptoms may be mild or nonexistent, and many symptoms are not unique to thyroid disease. Unlike most other chronic diseases, thyroid
problems are not caused by diet, lack of exercise, smoking, or other factors you can change. There does seem to be a genetic element.

People over 60, especially women, should be alert to the possibility of hypothyroidism.

According to the American Association of Clinical Endocrinologists, disorders of the thyroid are undiagnosed in many Americans particularly older women. Because they are at the greatest risk for thyroid disease, older women should request a blood test (TSH) for thyroid function as a part of their regular physical checkup.

If you have a question about the advisability of having the thyroid test, you may wish to consult with your doctor.


**Hypothyroidism**

Hypothyroidism is often more difficult to recognize and more common than hyperthyroidism in the elderly. The earliest sign of a failing thyroid is an increase in the blood level of thyroid stimulating hormone (TSH). TSH, a hormone produced by the pituitary gland, stimulates the thyroid to manufacture thyroid hormones. When thyroid function declines, the pituitary responds by increasing its production of TSH.

Large population studies have shown that as many as one woman in every ten over the age of 50 has a blood level of TSH that is above normal. Although most of these individuals have no symptoms and have thyroid hormone blood levels within the broad normal range, all have the beginnings of hypothyroidism. They should be carefully followed so that treatment with thyroid hormone can be give if overt hypothyroidism develops.

**Symptoms May Mimic Aging Process**

The symptoms of hypothyroidism in the elderly are unfortunately very easy to mistake for “normal aging.” Therefore, elderly individuals who gradually become hypothyroid may see a variety of specialists because of the various symptoms they may have. These include, mental confusion, depression, hoarseness, dry skin, deafness, muscle cramps, numbness and weakness of the hands, unsteadiness of gait, anemia, and constipation. It is easy to see why such vague and nonspecific symptoms can often be attributed to the aging process.

- *The John Hopkins Medical Handbook*

**Thyroid Diseases**

What are common thyroid diseases? About 20 million Americans have some form of thyroid disease. These are the most common: Hyperthyroidism – Hyperthyroidism means you have too much thyroid hormone. This makes your body use energy faster than it should. Treatment for hyperthyroidism involves radioactive iodine, anti-thyroid drugs, or surgery. Many times all three methods are appropriate, while at other times a single treatment may be the best option. **Hypothyroidism**—Hypothyroidism means you have too little thyroid hormone. This makes your body use energy more slowly than it should. Hypothyroidism is common; in fact, you can have
hypothyroidism for a number of years before it is recognized and treated. Treatment for all types of hypothyroidism is usually straightforward and involves thyroid hormone replacement therapy.

**Thyroid Cancer**—Thyroid cancer is fairly uncommon. About 15,000 new cases surface each year. Most people who have thyroid cancer have excellent chances of surviving for a long time. For instance, in younger patients, there is a better than 95% cure rate if the cancer is treated appropriately.

**Solitary Thyroid Nodules**—A solitary thyroid nodule is a small lump on the thyroid gland. As many as 50% of the population will have a nodule somewhere in the thyroid; however, the overwhelming majority of these nodules are harmless. Occasionally, thyroid nodules can be cancerous and need to be treated.

**Thyroiditis**—Thyroiditis means the thyroid gland is inflamed. Thyroiditis can have several symptoms such as fever and pain, but it can also occur as subtle findings of hypo- or hyperthyroidism.

**Goiters**—A thyroid goiter is a dramatic enlargement of the thyroid gland. This rarely happens in developed countries. Goiters are often removed for cosmetic reasons or, more commonly, because they compress other vital structures of the neck, including the trachea and the esophagus. This compression makes it difficult to breathe and swallow.

**What tests are used to detect a problem with the thyroid?**

The first test your doctor usually will order to detect a problem with your thyroid gland is a TSH test. If your TSH level is abnormal, the doctor usually will then order a total T4 or free T4 test to confirm the diagnosis. A total T3 or free T3 test may be ordered as well.

- **TSH** – to test for hypothyroidism, hyperthyroidism, screen newborns for hypothyroidism, and monitor thyroid replacement therapy.

- **T4 or free T4** – to test for hypothyroidism and hyperthyroidism and commonly used to screen newborns for hypothyroidism.

- **T3 or free T3** – to test for hyperthyroidism. When are these tests ordered?

**When are these tests ordered?**

The American Thyroid Association recommends that all adults be screened for TSH levels every five years beginning at age 35. And because one out of every 4,000 infants is born without a working thyroid gland, newborns are usually screened for thyroid hormone levels. Otherwise, these tests are ordered when your doctor notices that your symptoms resemble those of a thyroid condition. For instance, signs of hypothyroidism include fatigue, weight gain, cold intolerance, and skin dryness. Signs of hyperthyroidism include fatigue, weight loss, heat intolerance, and nervousness. Tests are also ordered in individuals who have a family history of thyroid disorders.

**The Thyroid Diseases Tests**

**FAQs**

1. **Are any thyroid diseases hereditary?**
   
   Yes, Hashimoto’s thyroiditis and Graves’ disease may run in families.

2. **Are thyroid diseases more common in men or women?**
   
   Yes, hypothyroidism is 10 times more common in women.
3. How often is pregnancy complicated by a thyroid problem? Thyroid dysfunction complicates 5% to 9% of all pregnancies. For more information, visit the Thyroid Society’s web page.

**B12 Bone Density**
A recent study has linked low bone mineral density in both men and women with Vitamin B12 deficiency. The B12 test costs $19.

**Hemoglobin A-1C**

**DIABETES INDICATOR**
With the pre-diabetics and diabetics on the risk in the US, the Hemoglobin A-1C Test is now added to our “shopping list” of biochemical screens.
COST: $12

**High-Sensitivity C-Reactive Protein (hs-CRP)**

C-Reactive protein (CRP) is an acute phase reactant produced by the liver under the control of interleukin-6. Its serum concentration can increase 1000-fold with acute inflammatory events such as infection, trauma, and surgery. Persistent increases in CRP can also occur in chronic inflammatory disorders, including autoimmune diseases and malignancy. Traditionally, CRP has been used clinically for monitoring infection and autoimmune disorders. Automated methods with detection limits of 3-5 mg/L are routinely available in the clinical laboratory for this purpose.

Chronic inflammation is an important component in the development of atherosclerosis. CRP concentrations have been shown to correlate with markers of endothelial dysfunction. Numerous studies have demonstrated that CRP can be used to help predict the risk of acute events in patients with atherosclerosis. Included in this list are several studies conducted in large populations of apparently coronary artery disease, cerebrovascular disease, or peripheral arterial disease. CRP has also been show to predict risk of future events in patients with acute coronary syndromes and in patients with stable angina and coronary artery stents.

- Clinical Chemistry 46:4

**hs-CRP Repeat Test**
If you chose to do the hs-CRP test, and your result came back high, the recommendation is to repeat this test in 2-3 weeks. Please contact and seek the council/advice of your family physician and follow his/her recommendation.

**The hs-CRP Test, Is it worth taking?**
From: Environmental Nutrition, September 2006 Vol 29 #9

In recent years evidence has mounted that, in addition to the standard Lipid Profile, CRP is useful for judging heart attack risk; many experts recommend getting a CRP test. The gold standard is the high-sensitivity form of the test (hs-CRP). Here is what hs-CRP levels mean for heart disease:

- **Low Risk** = Less than 1.0 milligram per liter
- **Average Risk** = 1.0 – 3.0 milligrams per liter
- **High Risk** = more than 3.0 milligrams per liter
The hs-CRP test is about internal inflammation, i.e. persistent inflammation. “Inflammation plays a role in ALL the diseases associated with getting older” says William Joel Meggs, M.D. of East Carolina University, and author of *The Inflammation Cure*. “It speeds up the progression of chronic conditions and may even incite some.”

*Arthritis* has long been the prime example of inflammation run amok. To name a few, inflammation has also been linked to:

- Heart disease
- Stroke
- Cancer
- Alzheimers
- Asthma

“People with normal total cholesterol and low-density lipoprotein sometimes have a high CRP level that may put them at risk for heart disease and stroke,” says Wahida Karmally, Dr. P.H, and R.D., of Columbia University. In fact, HALF of all heart attacks occur in people in the normal range. Research suggests that inflammation in blood vessels is twice as likely as elevated cholesterol to result in *ISCHEMIC STROKE* and death from cardiovascular disease.

*Please give consideration to taking this test.*

**Iron Screening-Why?**

Iron overload, known in medical circles as Hemochromatosis, is the most common genetic disorder in this country, affecting approximately 5/1000 people-mostly Caucasians of northern European descent. But not enough men and women are screened for the disorder; say researchers at the University of Utah school of medicine. That’s unfortunate because while the disease can have devastating complications, they’re avoidable when diagnosed and treated early enough.

The complications arise because the body absorbs too much iron from foods due to faulty metabolism. The excess iron then deposits itself in body tissues, causing everything from cirrhosis of the liver to arthritis (most often in the knuckles) to diabetes to congestive heart failure.

The Utah researchers found that too many men and women, Caucasians specifically, miss Hemochromatosis screening- and therefore miss appropriate treatment-when they tested siblings, parents, and children of people who had already been diagnosed. Of these 1st degree relatives, more than 80% of the men and 70% of the women turned out to have iron overload.

*People who know they have the disorder only have to go for blood-letting a few times a year to avoid dire consequences; much of the body’s iron is stored in red blood cells, so drawing blood draws off excess iron.*

-Tufts University Health & Nutrition Letter vol.18 #11 January, 2001

* In consultation with your doctor.

**VITAMIN D**

People who take Vitamin D supplements, the percentage of those with *sub-optimal levels* remains surprisingly high. Humans cannot arbitrarily consume *massive doses* of Vitamin D. For this nutrient,
individualized dosing is of particular importance and the only way to accomplish this is through Vitamin D blood testing.

Detecting deficient levels allows you and your doctor to implement Vitamin D supplementation. Optimizing your Vitamin D intake may be a safe and low-cost way to protect against:

- CANCER
- CARDIOVASCULAR DISEASE
- DIABETES
- IMMUNE DISORDERS
- MS
- DEPRESSION
- HIGH BLOOD PRESSURE
- ARTHRITIS
- LUPUS
- MS

The FSF charge for the Vitamin D blood test is $60.00

*Life Extension – May 2007*
*Alternatives – Dr. David Williams, April 2007, Vol. 11 #27*
*Health Gems News by Melissa Wilson, MS and Susan Carlson, RPh. Vol. 1 # 2. 2006*