Anemia in Older Persons

“All the soarings of my mind begin in my blood.”
Rainer Maria Rilke
Wartime Letters
1921

The word anemia is derived from the Greek word meaning “bloodlessness” (an=not; haimia = blood). In 2001, the World Health Organization defined anemia as a hemoglobin of less than 13g/dl in males and a hemoglobin less than 12g/dl in females.

Anemia in older persons is associated with negative health outcomes and increased mortality. These negative outcomes include falls, fatigue, frailty, functional decline, decreased cognition, impaired mobility, myocardial infarction, restricted mobility, increased hospitalizations, and an impaired quality of life.

The signs and symptoms of anemia in older persons are often nonspecific. They include fatigue, headache, dyspnea, dizziness, syncope, depression, decreased thought processes, tachycardia, palpitations, cold intolerance, edema, systolic ejection, murmurs, wide pulse pressure, orthostasis, anorexia, impotence, and pale skin, mucous membranes, and conjunctiva. Despite this plethora of medical clues, anemia is under-diagnosed and under-treated in older persons.

The prevalence of anemia in community-dwelling persons increases with age as was shown in both the KEEP1 and NHANES III2 studies. In persons between 61 and 75 years of age, the prevalence of anemia is between 8 and 15%. Beyond age 75, the prevalence varies from 16 to 26%. In a group of nearly 4,000 adults over

(continued on page 4)
Four Questions That May Save Your Grandma’s Life: SNAQ Screening Tool Predicts Weight Loss

ST. LOUIS — A four-question screening tool can predict which older patients with appetite problems are likely to lose weight, which places them at greater risk of death, according to Saint Louis University research.

The questionnaire is called the SNAQ (pronounced snack), the Simplified Nutritional Appetite Questionnaire, and takes less than two minutes to answer.

“This tool (printed at the top of page 3) tells us whether a poor appetite is likely to kill you. It identifies the patients who have problems with their appetite and will go on to lose weight,” says Margaret-Mary Wilson, M.D., associate professor of internal medicine/geriatrics at Saint Louis University and lead author.

“The watch-and-wait approach is dangerous when it comes to weight loss in older adults. We’re dealing with a problem that can be fatal.”

Appetite Problems Are Common

Wilson says that most people who are elderly find their appetite isn’t as robust as when they were younger. Their sense of taste and smell is blunted, and many older adults take multiple medications, which reduce appetite.

Chronic pain, multiple illnesses, depression and problems with dentures also make it less appealing or more difficult to eat.

Of this group of seniors with appetite problems, some will go on to lose weight, which triggers illness, frailty and potentially death.

Taking Action Early

“Weight loss is a disease we want to prevent. We can begin treatment before weight loss occurs and have an impact on outcomes. Using this tool, we can intervene before they begin to lose weight,” Wilson says.

The researchers asked appetite questions of 247 nursing home residents over age 60 from nine long-term care facilities in St. Louis. In addition, 868 residents from the St. Louis metropolitan area, about 40 percent of whom were at least 60, also were asked the questions.

The researchers then checked six months later to see if those who completed the questionnaire lost weight.

More than eight times out of 10, scores on the SNAQ identified those who would go on to lose 5 percent of their weight. The test was even more sensitive in predicting who would lose 10 percent of their weight, picking up the problem 88 percent of the time. The questionnaire was equally reliable for old and younger people, Wilson says.

Helpful to Younger Patients

“This is a tool that can be used in either population,” Wilson says. “This could be helpful in treating younger patients with AIDS, cancer and long-term chronic diseases that put them at risk of weight loss. Using this tool, we can intervene before they begin to lose weight.”

The SNAQ includes questions that rank the strength of appetite, feelings of fullness after eating, taste of food and number of meals eaten each day. A score at a certain level indicates the risk of significant weight loss within six months, and should spark a trip to the doctor and a nutritional assessment.

“We’re advocating it be used in all geriatric patient settings,” Wilson says. “It’s such a simple tool it can even be used by families. Don’t wait for weight loss to occur. Use the SNAQ.”

The research was published in the November 2005 issue of the American Journal of Clinical Nutrition.

The division of geriatric medicine at Saint Louis University is among the top 10 geriatrics programs in the country, according to U.S. News & World Report. Established in 1836, Saint Louis University School of Medicine has the distinction of awarding the first M.D. degree west of the Mississippi River. Saint Louis University School of Medicine is a pioneer in geriatric medicine, organ transplantation, chronic disease prevention, cardiovascular disease, neurosciences and vaccine research, among others.

The School of Medicine trains physicians and biomedical scientists, conducts medical research, and provides health services on a local, national and international level.

Questions? FAX: (314) 771-8575
**SNAQ**  
(pronounced “snack”)  
Simplified Nutritional Assessment Questionnaire

<table>
<thead>
<tr>
<th>Name:</th>
<th>Sex:</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td>Height:</td>
<td>Weight:</td>
<td>Date:</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>My appetite is</th>
<th>Food tastes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. very poor</td>
<td>a. very bad</td>
<td></td>
</tr>
<tr>
<td>b. poor</td>
<td>b. bad</td>
<td></td>
</tr>
<tr>
<td>c. average</td>
<td>c. average</td>
<td></td>
</tr>
<tr>
<td>d. good</td>
<td>d. good</td>
<td></td>
</tr>
<tr>
<td>e. very good</td>
<td>e. very good</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When I eat</th>
<th>Normally I eat</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I feel full after eating only a few mouthfuls</td>
<td>a. less than one meal a day</td>
<td></td>
</tr>
<tr>
<td>b. I feel full after eating about a third of a meal</td>
<td>b. one meal a day</td>
<td></td>
</tr>
<tr>
<td>c. I feel full after eating over half a meal</td>
<td>c. two meals a day</td>
<td></td>
</tr>
<tr>
<td>d. I feel full after eating most of the meal</td>
<td>d. three meals a day</td>
<td></td>
</tr>
<tr>
<td>e. I hardly ever feel full</td>
<td>e. more than three meals a day</td>
<td></td>
</tr>
</tbody>
</table>

Tally the results based on the following numerical scale: a=1; b=2; c=3; d=4; e=5. The sum of the scores for the individual items constitutes the SNAQ score. A SNAQ score of ≤14 indicates significant risk of at least 5% weight loss within six months.

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**Upcoming Nutrition Meetings in 2007**

Join us for the **International Academy of Nutrition**  
meeting in Adelaide, Australia  
on September 5-6, 2007. The meeting will be organized by Ian Chapman, John Morley, and Bruno Vellas.

Plan now to attend  
**The Fourth International Cachexia Congress**  
December 6-8, 2007, in Tampa Bay/St. Petersburg, Florida. It will be organized by Stefan Anker, Bill Evans, and John Morley.

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Questions? FAX: (314) 771-8575   •   email: aging@slu.edu   •   Aging Successfully, Vol. XVI, No. 2
Anemia in Older Persons

(continued from page 1)

In older community dwelling and hospitalized patients, anemia is associated with accelerated development of osteoporosis as well as with increased risk of falls in older community dwelling and hospitalized patients.8

The prevalence of anemia is even higher in residents in long-term care. The prevalence of anemia is even higher in residents in long-term care.

Physiological Factors Involved in the Production of the Normal Red Blood Cell

Physiological Factors Involved in the Production of the Normal Red Blood Cell

Short History of Blood

“...there are cases in which [the blood’s] amount of globules falls much below the physiological mean, and diminishing more and more, reaches a proportion so low that we can scarcely comprehend how, with so few globules in the blood, life can still be maintained. The diminution, in differing degrees, of the globular element of the blood is the fundamental character of anaemia, a condition which is the opposite of plethora.”

Gabriel Andral, 1843

A study of 481 persons with an average age of 81.4 years found a prevalence of 31.4%.9 Artz and his colleagues10 found a prevalence of anemia of 49% in a group of nursing home residents. In a group of 101 nursing home residents looked after by the faculty at Saint Louis University, 49% had a hemoglobin level below 12g/dl. Using these figures, we have estimated that there are 100,000 to 200,000 untreated nursing home residents with kidney disease and another half a million residents with anemia of chronic disease.

Production of Red Blood Cells

Red blood cells are produced in the bone marrow from multipotential stem cells which are converted into committed progenitors. The committed progenitor cells can either be encouraged to develop into erythrocytes by positive stimulators of erythropoiesis or be inhibited by negative factors. The major positive stimulatory factor is erythropoietin. It is produced by the kidney and circulates to the bone marrow where it stimulates erythropoiesis. Testosterone also stimulates the production of red blood cells. Several cytokines, such as tumor necrosis factor alpha, interferon gamma, and interleukin-6, act as inhibitors of erythropoiesis. These

(continued on page 5)
cytokines are usually elevated in inflammatory disorders and thus, as we will see, are important players in the pathogenesis of the anemia of chronic disease. Erythropoietin levels fall with kidney disease. Testosterone levels fall over the lifespan in males making it a possible agent involved in the pathogenesis of anemia of unknown etiology in older persons (see figure at top of page 6).

**Causes of Anemia**

The NHANES III study found that in older community dwellers in the United States, the most common types of anemia were iron deficiency anemia and anemia of chronic disease, with each present in approximately 20% of the population. Other anemias were less prevalent: megaloblastic anemia (14%), chronic kidney disease (8%), and mixed anemia of chronic kidney disease and anemia of chronic disease (4%). The prevalence of unexplained anemia was cause of the anemia was unexplained in 45% of persons. Persons with unexplained anemia had slightly higher erythropoietin levels than those with the anemia of kidney disease, but much lower than levels seen in iron deficiency or anemia of chronic disease. Interleukin-6 levels were very high in the anemia of chronic disease. In unexplained anemia, the interleukin-6 levels were higher than in the other anemias.

**Megaloblastic Anemias**

On a blood smear, megaloblastic anemias are characterized by large red cells and multinucleated white cells (see graphic above). The most common causes are vitamin B₁₂ deficiency or folate, deficiency. Other causes include drugs (including alcohol), rare genetic defects, and hypothyroidism. In persons with B₁₂ or folate, deficiency, homocysteine levels are elevated. In vitamin B₁₂ deficiency, methylmalonic acid levels are also elevated. Homocysteine may also be elevated in renal failure, hypothyroidism, estrogen deficiency, and homocystinuria. Homocysteine elevations are associated with accelerated atherosclerosis, cognitive dysfunction, and osteoporosis. Vitamin B₁₂ deficiency can be due to poor dietary intake and either bleeding or anemia of chronic disease. The hallmark of this disease is microcytic anemia with low serum iron and ferritin levels. Treatment involves iron replacement with either iron sulfate or iron gluconate. Iron sulfate needs to be given with meals because the sulfate moiety causes gastrointestinal distress. In most patients, iron sulfates

34%. There is much interest in the causes of this unexplained anemia of older persons. It would appear that it may be a mixture of failure of precursor cells coupled with a decline in testosterone and/or mild kidney failure and/or low levels of inflammation. This unexplained anemia is also called anemia (unspecified) or idiopathic anemia.

In residents of long term care institutions, the most common forms of anemia are iron deficiency anemia (23%), anemia of chronic disease (13%), anemia of kidney disease (6%), and myelodysplasia (5%). The

**Iron Deficiency Anemia**

Iron-deficiency anemia is usually due to a combination of poor dietary intake and either bleeding or anemia of chronic disease. The hallmark of this disease is microcytic anemia with low serum iron and ferritin levels. Treatment involves iron replacement with either iron sulfate or iron gluconate. Iron sulfate
Anemia in Older Persons
(continued from page 5)

Iron Deficiency Anemia (IDA) or Anemia of Chronic Disease (ACD)?

<table>
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<tr>
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<th>IDA</th>
<th>ACD</th>
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<tbody>
<tr>
<td>Serum Fe</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>TIBC</td>
<td>↑</td>
<td>↓</td>
</tr>
<tr>
<td>Ferritin</td>
<td>↓</td>
<td>↑</td>
</tr>
<tr>
<td>sTfR</td>
<td>↓</td>
<td>↑</td>
</tr>
</tbody>
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fate (325mg) once a day for six weeks is sufficient to replace the stores. In a few patients, higher doses are needed and some may even need intravenous iron.

Anemia of Chronic Disease

This is an anemia usually associated with a chronic inflammatory process. The diagnosis is made by finding a low iron level in the presence of an elevated ferritin level (see table). A serum ferritin level that is greater than 100mg/l excludes iron deficiency anemia. When the level is less than 18mg/l, the diagnosis is almost certain iron deficiency anemia. However, values between 18mg/l and 70mg/l in the presence of inflammation or renal failure are in a grey zone where either diagnosis may be appropriate. In these cases, soluble transferrin receptors may help make the diagnosis. They are usually 30% saturated. They are more saturated in iron deficiency anemia and normal or only slightly raised in anemia of chronic disease. Calculating a soluble transferrin receptor level over the log of ferritin is the best method to differentiate anemia of chronic disease from combined disease.

In the anemia of chronic disease, there are too few red cells which are of normal size and hemoglobin content and the half-life of red blood cells is shortened from 79 to 58 days. This is due to inadequate production to compensate for the rate of red blood cell destruction. Additionally, there appears to be a decreased response to erythropoietin coupled with iron being returned in the reticuloendothelial system instead of being released to be utilized for erythropoiesis in the marrow. Some forms of anemia of chronic disease are highly responsive to erythropoietin while others, e.g., cancer, are responsive only at very high doses of erythropoietin. A small number of persons with anemia of chronic disease are unresponsive to erythropoietin.

Inflammatory cytokines have three major ways in which they produce anemia: 1) Suppression of red blood cell precursor development; (2) Suppression of erythropoietin production; and (3) Inhibition of recycling of iron.

Sequestration of iron with a rapid drop in plasma iron occurs because interleukin-6 causes the liver to produce hepcidin. Hepcidin blocks the function of the iron transporters (ferroportin) in the gut and in macrophages. This results in failure to absorb iron and failure of the iron from ingested red blood cells to be available for recycling (see figure on page 7).

Anemia of Kidney Disease

Anemia of kidney disease occurs in 34% of persons with a serum creatinine level between 2.1 and 4mg/dl and 74% of persons with a serum creatinine greater than 5mg/dl. In older persons, the serum creatinine often fails to represent the true status of kidney function. This is called “masked renal disease” and occurs because older persons have often lost lean tissue mass and therefore have a lower production of creatinine than younger persons. The prevalence of

(continued on page 7)
Anemia in Older Persons

(continued from page 6)

low glomerular filtration rate (<60ml/min/1.73m²) can be estimated using either the Cockcroft-Gault or the MDRD (Modification of Diet in Renal Disease) formulas (see graphic at bottom of page). The estimated prevalence of a low glomerular filtration rate is higher when using the Cockcroft-Gault than the MDRD equation (see graphic at bottom of page).

Anemia of chronic kidney disease is caused predominantly by a reduced erythropoietin production. However, many of these patients may also have blood loss, folate loss, anemia of chronic inflammation, and erythropoietin-induced iron deficiency.

Erythropoietin was cloned by Lin and his colleagues in 1983 and two years later, recombinant erythropoietin was first given to a patient. By 1989, the first trial demonstrating that erythropoietin stimulated erythropoiesis in humans with kidney failure was published. Use of erythropoietin for patients on dialysis was approved in the same year and in the following year, it was approved for chronic kidney disease for patients not on dialysis. In 2001, darbepoetin-alfa, an erythropoietin-like agent with a longer half-life was shown to safely correct the anemia of chronic kidney disease. Erythropoietin is a 30,400 Dalton glycoprotein, rich in sialic acid, whose production is regulated by reduced oxygenation of the kidney. It has minimal side effects including very occasionally high blood pressure or sei-

(continued on page 8)
Anemia in Older Persons
(continued from page 7)

It also improved exercise performance, cognition, and quality of life. Darbepoetin has a longer half-life, three times as long as EPO; otherwise it is similar to EPO (see table below). In patients with chronic kidney disease, darbepoetin can be used monthly. When erythropoeitin-like products are being used, the hemoglobin should not be increased more than 1g/dl per month and Medicare stops reimbursement when levels rise above 12g/dl.

Resistance to erythropoeitin occurs when there is iron deficiency. Therefore, ferritin levels have to be carefully followed and iron replaced when levels fall. Malnutrition, cancer, and inflammatory conditions are all associated with resistance to erythropoeitin therapy. It is essential to make sure the patient has adequate iron stores during treatment with erythropoeitin. Very rarely, pure red cell dysplasia occurs when a person receives an erythropoeitin product. This is due to antibodies developing against the product.

Our experience in the nursing home has suggested that most patients with a hemoglobin less than 10g/dl have a reduced glomerular filtration rate as determined using the Cockcroft-Gault equation. We have shown in a small number of patients aged 66 to 85 to correct their anemia and reduce transfusion needs.

Comparison of Erythropoeitin and Darbepoetin

<table>
<thead>
<tr>
<th>Erythropoeitin</th>
<th>Darbepoetin</th>
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<tbody>
<tr>
<td>Molecular Weight</td>
<td>30,400d</td>
</tr>
<tr>
<td>Sialic Acid</td>
<td>Increased</td>
</tr>
<tr>
<td>Half Life (hours)</td>
<td>24</td>
</tr>
<tr>
<td>Dose Adjustment</td>
<td>Monthly</td>
</tr>
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</table>
been very satisfied with the administration of the long-acting erythropoietin analog once per month.

**Anemia in Older Persons**

(continued from page 10)

Myelodysplasia

Myelodysplasia occurs in up to 5% of older persons. Hemoglobin is reduced in 100% of those patients with myelodysplasia, neutrophils in 50%, and platelets in 25%. The hallmark in the peripheral blood smear is hyposegmented white cells nuclei, with granular content associated with megakaryocytes. The bone marrow shows hypercellularity, ringed sideroblasts, and increased blasts. The severity of the disease can be assessed by looking for deletion of chromosome 5g and monosomy of chromosome 5 or 7. In the past, the only treatment was repeated blood transfusions. Now, erythropoietin and GMCSF (granulocyte-macrophage colony-stimulating factor) can reduce the number of transfusions.

**Anemias with an Increased Reticulocyte Count**

Hemolysis and blood loss result in anemias with elevated reticulocyte counts. Blood loss in urine and stool lar volume is increased (macrocytosis), they may have vitamin B₁₂, or folate, deficiency. If these levels are normal, and there is an associated decrease in white cells and/or platelets, a bone marrow test may be necessary to diagnose myelodysplasia. If the reticulocyte count is elevated, the differential diagnosis is hemolysis associated with increased unconjugated bilirubin or an hemorrhagic disorder. An algorithmic approach to the diagnosis and treatment of anemia is shown on pages 12-13.

**Conclusion**

Anemia is often ignored in older persons. In view of the high rate of renal failure in this population and the excellent response to EPO and darbepoetin, this is no longer acceptable. Anemia plays a major role in many of the geriatric syndromes and reduces the quality of life in older persons. There is a major economic impact of leaving anemia untreated in older persons.

**References:**

In my mind, the two secrets to being a successful geriatrician are remembering that function is more important than death and that often new drugs and technology are the result of decreased function and early death for those of us who are aging. The proof of this is seen in the fact that despite spending 16% of our Gross National Product on health care, the United States has about the twenty-seventh best health care outcomes in the world. In fact, we are ranked alongside Cuba in health care outcomes and far behind our northern neighbor, Canada.

In my long career in medicine, I have grown suspicious of new interventions as cure-alls for our older years. The claims of anti-aging medicine are often seen as mainstream medical breakthroughs with little evidence that they actually improve quality of life or longevity. It is this background that makes the emergence of anemia as a major cause of functional deterioration in older persons so exciting. There is increasing evidence that anemia is associated with orthostasis, falls, frailty, functional decline, cognitive decline, and depression. When I first became a geriatrician, it was generally believed that anemia was extremely common in older persons and that little attention should be paid until the hemoglobin fell to below 10g/dl. If the person failed to have megaloblastic anemia (vitamin B12, or folate, deficiency) or an obvious cause of bleeding, then they would be put on iron sulfate (often in excessive amounts, e.g., 220 mg three times a day), even though it was known it would have no effect on the common anemias of older persons, namely anemia of chronic disease, anemia of kidney failure, and anemia of unknown origin. If the hemoglobin fell to levels where the person showed obvious distress, as occurs regularly in myelofibrosis, the treatment of choice was transfusion. This was despite the multiple side effects associated with blood transfusion.

In the last few years, it has become clear that many older persons with anemia can have their quality of life dramatically improved by treatment with erythropoietins – EPO and darbepoetin-alfa. In addition, iron can be given as iron gluconate, instead of iron sulfate which can create marked gastrointestinal distress.

The erythropoietins have truly become a fountain of youth for older persons with anemia. In these persons, they can truly be rejuvenating agents. However, we need to remember that only after an appropriate diagnostic approach has been completed should the use of these agents be considered. Also, as with all miracle drugs, these agents have side effects that need to be carefully weighed – before and during therapeutic interventions.

We are grateful to Amgen for providing an unrestricted educational grant to Saint Louis University to allow us to produce this Special Issue of Aging Successfully which focuses on anemia. Their drug, darbepoetin-alfa is approved by the FDA for the treatment of anemia of kidney failure. All opinions about the management of anemia in older persons expressed in this Special Issue of Aging Successfully are based on the opinions of the Division of Geriatric Medicine at Saint Louis University and not those of our sponsors.

In 1985, Esbach gives rEPO to a patient.
In 1989, the FDA approves use of EPO in dialysis.
In 2001, darbepoetin safely corrects anemia of chronic kidney disease.
In 2002, West Nile virus identified as transfusion transmissible.
Caring for the Vulnerable
June 6-7, 2006

IMPORTANT INFORMATION:

Due to increased costs, we will be making the conference details (including brochure and registration form,) for the 2006 SUMMER GERIATRIC INSTITUTE available on the Internet at http://aging.slu.edu.

Please visit this site for conference information.
You may print out the registration form to register.

THIS YEAR, THE SUMMER GERIATRIC INSTITUTE WILL BE PAPERLESS!
A CD CONTAINING ALL OF THE HANDOUT MATERIALS WILL BE DISTRIBUTED TO ALL REGISTERED PARTICIPANTS AFTER THE CONFERENCE CONCLUDES.
TO SUPPLEMENT THE HANDOUT MATERIALS ON THE CD, YOU MAY WISH TO TAKE YOUR OWN NOTES DURING THE SPEAKERS’ PRESENTATIONS.
ANEMIA in OL

Effects of Anemia

Fatigue
Syncope
Anorexia
Venous hum
Angina
Cold intolerance
Tachycardia
Pallor (palms)
Decreased exercise tolerance

Cognitive impairment
Dizziness
Headache
Pallor (mucous membranes)
Dyspnea
Systolic ejection murmur
Hypotension
Orthostasis
Wide pulse pressure
Palpitations
Edema

Decreased exercise tolerance
Fatigue
Decreased function
Mobility impairment
Orthostasis
Depression
Mortality
Left ventricular failure
Falls
Fatigue
Heart failure
Myocardial infarction

Signs and Symptoms of Anemia

Syncope
Anorexia
Venous hum
Angina
Cold intolerance
Tachycardia
Pallor (palms)
Decreased exercise tolerance

Dizziness
Headache
Pallor (mucous membranes)
Dyspnea
Systolic ejection murmur
Hypotension
Orthostasis
Wide pulse pressure
Palpitations
Edema

Decreased exercise tolerance
Fatigue
Decreased function
Mobility impairment
Orthostasis
Depression
Mortality
Left ventricular failure
Falls
Fatigue
Heart failure
Myocardial infarction
Approach to Management of Anemia

**Corrected reticulocyte count**

- **Decreased**
  - Erythropoiesis
  - Protein? Iron, vitamin B₁₂, folate
  - Nutrients

- **Increased**
  - Erythropoietin

**Increased reticulocyte count**

- Hemolysis
- Hemorrhage

**Decreased reticulocyte count**

- Mean corpuscular volume
- Lactic dehydrogenase
- Increased low or normal vitamin B₁₂, folate levels
- Borderline low normal
- Homocysteine, methylmalonic acid
- Increased
- Neutropenia and/or thrombocytopenia
- Yes no
- Myelodysplasia, bone marrow
- Macrocystic anemia
- Other diagnosis

**Unconjugated bilirubin**

- Increased normal hemorrhagic
  - Hemolysis
  - Fecal occult blood

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China Captures the Heart of SLU’s Dr. Joseph Flaherty

Dr. Joseph Flaherty, has spent the past several months in China on sabbatical. He chose to go there because China has the fastest growing percentage of elderly population. Because of this fact, he is studying and assisting the Chinese medical community in implementing Acute Care for the Elderly (ACE) Units in the hospitals of China. In addition to these responsibilities, he is developing a collaborative effort conference for geriatricians/cardiologists.

The Great Wall International Congress of Cardiology will be held November 2-5, 2006 in Beijing. During this conference, the first collaborative geriatrics conference between Saint Louis University School of Medicine and Peking Medical University First Hospital will be held. The tentative speakers and their topics and affiliations are:

- WEIGHT LOSS WITH AN EMPHASIS ON CARDIAC CACHEXIA;
- CONTROVERSIES IN THE TREATMENT OF CHOLESTEROL AND HYPERTENSION IN THE ELDERLY;
- METABOLIC SYNDROME IN THE ELDERLY (John E Morley, MB, BCh, Saint Louis University School of Medicine, Department of Internal Medicine, Division of Geriatric Medicine, USA);
- HEART FAILURE IN OLDER ADULTS: EPIDEMIOLOGY, PATHOPHYSIOLOGY, DIAGNOSIS, AND MANAGEMENT;
- HEART FAILURE DISEASE MANAGEMENT: A MULTIDISCIPLINARY APPROACH (Michael W. Rich, MD, FSGC, Division of Cardiology, Washington University School of Medicine, St. Louis, Missouri USA);
- HONG KONG’S SYSTEM OF GERIATRICS (Dr. LW Chu, Department of Medicine, Hong Kong University, Hong Kong, China);
- The Confused Elderly Hospitalized Patient; The United States’ system of geriatric care (Joseph H. Flaherty, MD, Saint Louis University School of Medicine, Department of Internal Medicine, Division of Geriatric Medicine, USA). To learn more about this conference, normally attended by over 10,000 participants, visit http://www.gw-icc.org.

Watch for the next issue of Aging Successfully to learn more about Dr. Flaherty’s experience in China.

Been here? Done this?

Offering regular updates on geriatrics, Cyberounds, an internet-based educational program for physicians and other health professionals, is edited by Dr. John E. Morley. The Internet address for Cyberounds is:

www.cyberounds.com

A cybersite for seniors has been developed in collaboration with Saint Louis University and the Gateway Geriatric Education Center. Besides articles written by geriatric experts, this site provides health updates and an interactive question and answer section. The address for this site is:

www.thedoctorwillseeyounow.com. See you in cyberspace!
Men’s life expectancy is significantly shorter than that for women. As pointed out by the president of the International Society for the Study of the Aging Male (ISSAM), Bruno Lunenfeld, MD, “The ability to permit men to age gracefully and maintain independent-living free of disability is a crucial factor in aging with dignity and would reduce health costs.” The ISSAM has been the world-wide leader in examining the social and medical consequences of aging with the aim to improve the health status and quality of life of men. The fifth ISSAM meeting was held in Salzburg, Austria. Over 1,000 members from more than 40 countries attended the meeting.

A highlight of the meeting was a number of presentations examining the role of testosterone in the genesis of the metabolic syndrome. This syndrome of insulin resistance is characterized by glucose intolerance, hypertension, hyperuricemia, altered coagulation factors, abnormal lipids (low HDL, increased small dense LDL) and myosteatosis (fatty infiltrate in muscle). This combination of factors is associated with a marked increase in cardiovascular disease. It is clear that both diabetes mellitus and an increase in waist-to-hip ratio are associated with a decline in circulating testosterone levels associated with a decrease in sex hormone binding globulin. Testosterone replacement increases fat free mass and decreases fat mass, particularly visceral (or “bad”) fat. Professor Jones from the University of Sheffield reported on a trial in which testosterone was replaced in hypogonadal men who had diabetes mellitus. Testosterone therapy was associated with improved insulin resistance, glycemic control, waist-to-hip ratio, and total cholesterol. Professor Arver from the Karolinska Institute in Sweden had less dramatic results in a group of more severe diabetics. He did find improvements in body composition and a decrease in liver steatosis. Testosterone has also been shown to decrease atherosclerosis and improve outcomes in patients with heart failure. These findings led (continued on page 16)

For more information, see www.issam.ch

Questions? FAX: (314) 771-8575  •  email: aging@slu.edu
Professor Vermeulen from Belgium to suggest that it would be tempting to administer testosterone to prevent coronary artery disease in male diabetics.

Lower urinary tract symptomatology (LUTS) occurs in over 26% of men in their eighties. It is associated with urinary frequency, urgency, dysuria, hesitancy, nocturia, and incontinence. It is commonly associated with benign prostatic hypertrophy. A number of studies have shown a strong association between LUTS and erectile dysfunction. Reasons why these two conditions commonly co-exist include a decrease in nitric oxide synthase activity, increased circulating norepinephrine, pelvic atherosclerosis resulting in loss of smooth muscle with replacement by fibrosis and collagen in both the penis and the bladder, and possibly a decline in testosterone level.

A number of presentations highlighted the importance of adequate levels of testosterone to allow the phosphodiesterase-5 inhibitors, e.g., Viagra®, to produce adequate erections. Testosterone is essential for the function of nitric oxide synthase.

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**ADAM QUESTIONNAIRE**

**Androgen Deficiency in Aging Males**

1. Do you have a decrease in libido (sex drive)? _________________________________________

2. Do you have a lack of energy? _____________________________________________________

3. Do you have a decrease in strength and/or endurance? _______________________________

4. Have you lost height? _____________________________________________________________

5. Have you noticed a decreased “enjoyment of life”? _________________________________

6. Are you sad and/or grumpy? ______________________________________________________

7. Are your erections less strong? ____________________________________________________

8. Have you noted a recent deterioration in your ability to play sports? __________________

9. Are you falling asleep after dinner? ________________________________________________

10. Has there been a recent deterioration in your work performance? ____________________

This questionnaire was developed by John E. Morley, MB, BCh. It is to be used solely as a screening tool to assist your physician in diagnosing androgen deficiency.
Aging Smiles Shouldn’t Become Extinct
Deborah S. Manne, RDH, RN, MSN, OCN®

Dental caries involving the root surface are the most common cavities for older adults. This is because the root is made up of dentin, a softer substance than enamel, and is more likely to decay. Xerostomia also contributes to this. Saliva actually helps protect the teeth against decay by helping to remineralize them. But with less saliva and saliva that is more acidic than normal, the conditions are right for increased caries. Making sure that the older adult uses fluoride toothpaste daily is an important step toward reducing the risk of tooth decay.

Most adults have periodontal disease. But older adults may show signs of more advanced forms of periodontal disease because of lack of regular care. There is no reason for any older adult to become edentulous, or toothless, in this day and age. Regular dental visits at least twice a year (once a year if edentulous) will help older adults maintain their oral health.

Oral infections may be caused by bacteria, viruses, or fungi and need to be caught early in order to prevent long-term side effects. Oral cancer is often seen in persons over the age of 65 (ten years earlier for African Americans) and has a poor prognosis if not caught early. Teeth are meant to last a lifetime. Some lifelong habits listed in the box below will help make them last.

Keeping Aging Smiles Healthy for a Lifetime
◆ Have regular dental visits. Twice a year is best; if completely edentulous, then at least once a year.
◆ Practice good oral hygiene - proper toothbrushing twice a day; floss once a day.
◆ Use fluoride. Fluoride toothpaste is fine, or if recommended by a dental professional, use a daily fluoride rinse or brush-on fluoride gel.
◆ Teach patients/clients, family members, and caregivers how to check the mouth and know what’s normal and what requires immediate attention.

Remember:
LOSING ALL YOUR TEETH IS NOT A NATURAL PART OF AGING.
TEETH ARE MEANT TO LAST A LIFETIME.
WITH PROPER CARE, THEY WILL.

Deborah S. Manne is a registered dental hygienist in the Department of Graduate Periodontics at the Center for Advanced Dental Education (CADE), and an Adjunct Instructor in the Division of Geriatric Medicine at Saint Louis University. She is also a registered nurse with a lifelong interest in helping people keep their smiles healthy. She provides clinical dental hygiene services to patients of the Graduate Periodontics residents at CADE and teaches nursing students and faculty as well as medical residents and faculty about the importance of maintaining oral health. She may be reached at 314-977-8381 or mannedt@slu.edu

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Data from the InCHIANTI study in Italy showed a close association between the development of anemia and hypogonadism. Data from the Massachusetts Male Aging Study showed that low testosterone was associated with an increased mortality risk, but after adjustment for covariates, this risk was no longer statistically significant (HR=1.8, 95% CI: 0.97-3.36). Low testosterone was a highly significant predictor of cancer mortality.

John McKinlay and his colleagues presented the first data from the Boston Area Community Health (BACH) survey. Urinary incontinence increases with age from 1.97% in 30 to 39 year olds to 10.40% in 60 to 79 year olds. It is more common in persons who have evidence of atherosclerosis and in those with depressive symptoms. Bone mineral density was higher in black men than in white and Hispanic men, which explains the lower fracture rates in this population. There was no evidence of racial differences in testosterone and bioavailable (continued on page 19)
testosterone. They showed substantial variability in day-to-day testosterone measurements, suggesting that more than one testosterone measurement some days apart may be necessary to make the diagnosis of hypogonadism.

Other presentations highlighted the poor quality of commercially available testosterone assays and the problems associated with defining a symptom complex that is specific for hypogonadism in older men.

In a symposium organized by the group from Saint Louis University, Dr. Morley highlighted that beyond the age of 60 years, weight loss is associated with increased mortality, hip fracture, and institutionalization. He pointed out that the four major causes of weight loss are:

- Dehydration
- Anorexia
- Sarcopenia
- Cachexia

He then went on to discuss the multiple causes of sarcopenia (age-related loss of muscle mass) (see sarcopenia figure on page 18). He pointed out that at present, resistance exercise is the best treatment for sarcopenia. However, creatine supplementation and testosterone have shown some promise in reversing sarcopenia.

Myostatin inhibits muscle growth and a number of companies are developing myostatin inhibitors such as peptobodies (Fc fragments) at Amgen and myostatin antibodies at Wyeth. Dr. Haren then highlighted that muscle is (continued on page 22)
Hungry for Knowledge
Research Links Hormone Responsible for Appetite to Learning and Memory

ST. LOUIS - The hormone produced in the stomach that tells you you’re hungry also helps you remember and learn, according to a new study co-authored by Saint Louis University scientists.

While more research is needed, the findings could point to a new direction for a treatment for Alzheimer’s disease: a replacement therapy for ghrelin, the hunger hormone, to restore memory.

“This shows a direct link between the stomach and the brain,” says John E. Morley, M.D., director of the division of geriatric medicine at Saint Louis University and study researcher. “A human is truly what he or she eats.”

The research is published in an on-line edition of Nature Neuroscience 9:3;381-8, 2006. It shows that high levels of ghrelin, which is the hormone that regulates our appetite, trigger activity in the part of the brain responsible for learning and memory performance.

The researchers compared mice that had normal ghrelin levels with those that had the ghrelin-producing gene switched off. Those that lacked the gene did not do as well on a battery of behavioral tests.

After those without the gene received ghrelin replacement therapy, their memory improved and their ability to learn was restored.

“Ghrelin may have a physiological role in maintaining memory,” Morley says.

He speculated that the ghrelin response could date back to the time when man had to forage for food when he was hungry.

“If you’re searching for food, it’s convenient to have a message going to the brain that says, ‘next time, remember this because you will get hungry and might need to find this spot again,’” he says.

The study was supported by the National Institutes of Health and a VA Merit Review grant. Yale University and Washington University scientists also collaborated in this study.
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While you’re there, check out the screening tools, links to other useful sites, and information about our upcoming conferences.

If you need additional paper copies of a previous issue of Aging Successfully, please email us at aging@slu.edu.

SERVICES
Services of the Division of Geriatric Medicine, Saint Louis University Health Sciences Center include clinics at two locations in the following areas:

- Aging and Developmental Disabilities
- Bone Metabolism
- Falls: Assessment and Prevention
- General Geriatric Assessment
- Geriatric Diabetes
- Medication Reduction
- Menopause
- Nutrition
- Podiatry
- Rheumatology
- Sexual Dysfunction
- Urinary Incontinence

For an appointment, call 314-977-6055 (at Saint Louis University) or 314-966-9313 (at Des Peres Hospital)

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Crossword Puzzle Book
Challenges and Choices
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SLU GEMS
Emergency Preparedness CD
Books

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in a constant state of flux with muscle hypertrophy balancing atrophy and muscle regeneration balancing apoptosis. His presentation focused on the biochemical pathways involved in these processes. The anabolic hormones appear to produce their effects by stimulating AKT which drives the muscle hypertrophy system while inhibiting the atrophy system. Testosterone can also stimulate muscle repair through activating the beta-catenin pathways. Atrophy of muscle is driven by elevated cytokine levels that lead to activation of atrogin and MURF-I. These activate the ubiquitin-proteasome system. Proteasomes are the death chambers of cells that break proteins down into amino acids. Recent studies have suggested that many of the age-related changes that lead to sarcopenia are due to alterations in circulating factors in the blood that occur with aging.

Two new methods of administering testosterone to males were unveiled at the meeting. Testosterone undeconoate injections (Nebido®) allows injections to be given once every three months, rather than the weekly or two-weekly regimens used at present. The data presented suggested that this is a very safe method for delivering testosterone.

Dr. Christian Sigg presented the first data available for a nasal-inhalation form of testosterone (Nasobol®). Administration of Nasobol®, twice daily, produced an excellent pharmacokinetic profile. No side effects were seen. A survey of 300 physicians in the United States suggested that this would be highly acceptable to 95% of their patients.

In Angelica’s Grotto by Russell Hoban, first published in 1999, the protagonist of the novel stated, “I sometimes think a dirty old male is the only kind of old male there is!” David Saul from Toronto, Canada, used this citation to highlight his open-labeled trial of testosterone in olderhypogonadal, impotent men. His study showed that testosterone replacement allowed 40% of these men to have good erectile recovery without phosphodiesterase-5 medications.

I hope that you have enjoyed this brief overview of some of the exciting new findings presented at the 5th Biennial ISSAM conference. If you have, we hope that you will plan to join us at the 6th ISSAM Conference in 2008 which will be held in the USA for the first time. Tampa Bay, Florida will host the conference which will be organized by Drs. Lunenfeld and Morley, with the help of an impressive scientific committee from all around the world.

For persons over 40 years of age with sexual difficulties, the Division of Geriatric Medicine at Saint Louis University represents one of the major centers in the world for the management of sexual problems.
Upcoming CME Programs

SLU Geriatric Academy (SLUGA)
July 10-14, 2006

4th International Academy on Nutrition and Aging
September 5-6, 2007
In Adelaide, Australia

18th Annual SLU School of Medicine Symposium for Medical Directors
and 26th Annual GRECC Conference
Dec 9, 2006

4th Annual Rush Elder Rights Forum
April 7, 2006 at Rush University Medical Center in Chicago, Illinois

6th World Congress on The Aging Male
2008
Tampa Bay, Florida, USA

4th International Cachexia Congress
December 6-8, 2007
Tampa Bay/St. Petersburg, Florida, USA

All of the conferences will be held at Saint Louis University, except as noted. For more information about any of these conferences, please call 314-977-8848.

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