Diabetes Mellitus: A Disease of the Elderly in the U.S.

Diabetes mellitus (DM) occurs in nearly one of every five persons over the age of 65 years. Approximately half of all the persons with DM are over the age of 60 years.1 One third of all residents in nursing homes have DM. Despite this, physicians are “sugar blind” when it comes to recognizing the presence of DM in older persons. At least a quarter of older persons with DM do not have the diagnosis made by their physician. This is in part because physicians believe that aging is associated with the development of insulin resistance, and thus elevated blood sugars are a normal concomitant of aging. Recent work by Drs. William Banks and David Thomas has questioned the belief that aging \textit{per se} results in elevated glucose levels, and suggests that the insulin resistance is due to cytokine excess. Insulin resistance also occurs in persons who have elevated triglycerides (a form of fat). This excess fat accumulates in muscle, blocking the ability of the insulin receptor to phosphorylate (transfer energy to) the GLUT transporter (the apparatus that allows glucose to be actively transported into cells).

Finally, mitochondrial DNA damage that occurs with aging can lead to increased accumulation of triglyceride in cells resulting in hy-

(continued on page 4)
Increasingly, physicians are being expected to treat patients by following published guidelines. These guidelines are usually created by expert panels who have theoretically reviewed the evidence available to support the guidelines. Unfortunately, these panels often finish by producing “eminence-based” rather than “evidence-based” guidelines. A greater problem is that there are little or no data available for the treatment of persons over 75 years of age. Unfortunately, for geriatricians, this represents the majority of the people we treat. A further problem is that older persons often have multiple diseases resulting in a propensity for polypharmacy. The physician is left with the dilemma of whether they should treat diabetes, hypertension, elevated cholesterol, and dementia, or decide to treat only those conditions that seem most in need of treatment in order to avoid drug-drug interactions.

There are some clear examples where guidelines fail to take into account the available evidence in older persons. For example, the studies of hypertension in older persons have led to a recommendation to reduce blood pressure levels to below 160 mmHg and yet most available guides suggest physicians should aim for much lower levels. In persons 80 years and older, a meta-analysis and the subsequent HYVET pilot trial have suggested that even treatment of a blood pressure to the level of 160 mmHg may increase mortality!

The PROSPER study, which examined the effectiveness of treating elevated cholesterol levels in persons over 70 years of age, showed a decrease in heart disease-associated mortality. However, there was no decrease in total mortality, functional status, or memory problems. In my mind, this questions the utility of cholesterol lowering in older persons.

Physicians commonly use colace or pericolace for the treatment of constipation despite the fact that there is no evidence that these agents are efficacious. Overall, the improvements seen with drugs to treat dementia are miniscule and of questionable clinical significance. In one major study, the authors claimed a positive effect despite the fact that the drug failed to meet the study’s predetermined level of efficacy.

Clearly, there is a need to increase the number of drug studies done in persons over 65 years of age. Equally, it is important that these studies require a meaningful endpoint such as quality of life, decreased hospitalizations, decreased nursing home placement, or decreased total mortality. Clinical guidelines should not be based on studies showing an improvement for surrogate endpoints (e.g., lowering blood pressure or cholesterol levels) or for a decreased mortality in one condition while ignoring overall mortality and function. In addition, before new drugs are used in nursing home residents, the FDA should require studies in this population.

While I realize that we are a long way from these goals, I do think it is reasonable not to ignore available evidence in older persons and not to over-extrapolate data in younger persons by applying them to older persons. Evidence in a 50-year old may or may not apply to an 80-year old. In this era of moving towards evidence-based medicine, it is important that we avoid continuing to believe that studies in middle-aged persons can be applied to the elderly. We need to pressure the FDA to require studies in sufficient numbers of persons over 75 years of age to determine the efficacy and side effects in that population before new drugs are approved. Similarly, limited studies of a sufficient size to determine potential side effects should be carried out in nursing home residents. It is also important that we require clinically relevant, rather than statistically positive, outcomes.

Dr. John E. Morley
IN THE SUMMER OF 2006, A SEVERE THUNDERSTORM LEFT HALF A MILLION ST. LOUISANS WITHOUT ELECTRICITY. THIS INCLUDED OUR 220 BED NURSING HOME (NHC MARYLAND HEIGHTS). OUR DISASTER PLAN WENT INTO ACTION AND WITHIN 90 MINUTES, ALL MANAGERS WERE IN THE NURSING HOME, EVEN THOUGH OUR POWER LOSS OCCURRED IN THE EVENING.

Portable generators were put into operation, allowing operation of low air loss mattresses, fans, lights, and the phone system. Flashlights were provided to all staff. By 3 a.m., the electricity company informed us that power would not be restored for three to five days. Our strategic long-term plan required that under these circumstances, the nursing home needed to be evacuated to allow us to meet the needs of our residents. The projected heat index was 110°F and the indoor temperature had already reached 85°F.

We established an information center at the front door of the facility. Identification bands were put on all residents and their destinations were recorded as they left the building. We established a relocation center run by the assistant director of nursing (ADON) who determined appropriate placement, means of transportation, and level of resident assistance required. Families were called by the social workers to inform them of plans for their loved ones.

Information center, where ID bands were issued and residents’ locations logged.

Our contract with the local police force allowed them to identify a junior high school gym for relocation and a local hospital agreed to accommodate our very ill patients. We worked with other NHC facilities in the area to accommodate the remaining residents. We identified a few rooms in our facility that, with auxiliary power, could maintain a reasonable temperature and moved some residents to these areas.

Transportation was provided by a local community center-based private ride service. Staff transported equipment and supplies in their private vehicles. Medical records were moved with residents as they relocated. Activities staff moved with the residents to the gym and provided TV/VCR, Bug Bingo, and food activities. Meals were provided by a pre-existing contract for cold storage, an emergency menu pre-arranged with a local vendor and creative meal preparation, such as barbecue and pizza delivery. Pre-made pureed items were available. Help was volunteered by home health care and hospice organizations.

When the blackout was over, we created a welcome (continued on page 14)
perglycemia. Only this last, relatively rare mechanism could be considered a true age-related cause of hyperglycemia.

DM was first recognized as a disease by the Ayurvedic physician, Susruta, who noticed that when some persons urinated in the street, their urine was a strong attractant for ants. He called this madhumeha (“honey urine”). He also noted that there were two types of diabetic patients: young, skinny ones (Type I) and older, more obese ones (Type II).

It turns out that DM in older persons is a combination of insulin resistance, predominantly in muscle, and a failure of adequate insulin secretion from the Islets of Langerhans in the pancreas. This has been called Type 1½ diabetes. In older persons, there is little difference in the ability of the liver to handle glucose – a dramatic difference from the classic changes that occur in the middle-aged person with Type II diabetes, where the major area producing insulin resistance is failure of insulin sensitivity in the liver. Other differences in older diabetic patients are that they tend not to be excessively overweight (although they often have visceral obesity) and they develop a mixed hyperglycemic ketoacidotic coma, as opposed to the classical hyperosmolar coma seen in middle-aged Type II diabetic patients (see table above). Recently, with the discovery that multiple hormones produced from fat cells can modulate glucose metabolism, it has been realized that the maintenance of glucose homeostasis is inordinately complex (see Figure 1). Adiponectin is a fat cell hormone that decreases glucose levels and whose levels are affected by obesity and aging.

Clinical Features of DM in the Older Person

Multiple studies have shown that older persons with DM are more likely to be frail, have injurious falls, and develop functional disability at a younger age than non-diabetic patients. Hypoglycemia results in delirium.

Hyperglycemia leads to greater pain perception and more complaints about pain. Moderate hyperglycemia is associated with memory (continued on page 5)
problems that can be reversed by lowering the glucose to normal levels. Older patients with DM are more likely to develop both vascular dementia and Alzheimer’s disease. It is possible that the increased prevalence of Alzheimer’s disease is due to the fact that the insulin-degrading enzyme also degrades amyloid-beta protein in the brain.

Depression occurs more commonly in patients with DM. Its presence needs to be carefully looked for, as it is a major cause of poor diabetic control, increased hospitalization, and death.

The combination of learning and memory problems, depression, and visual problems makes the diabetic patient at major risk for having compliance problems. Dr. Syed Tariq has shown that persons with DM have a much greater failure rate in remembering physician instructions than do their non-diabetic counterparts. It is important to write down all instructions for patients with DM in large writing and in plain, simple language. Increased awareness of the health literacy problems experienced by older persons with DM is essential if health care professionals are to enhance the care for those persons.

Aretaus the Cappadocian suggested that DM is a disease of the stomach. This remains the case in modern times where diabetic persons have many more gastrointestinal complaints than do non-diabetic patients. Increased levels of glucose delayed gastric emptying and long-term DM can lead to autonomic neuropathy and gastroparesis. The presence of major changes in stomach emptying can lead to alternating episodes of hyper- and hypoglycemia following a meal.

Postprandial hypotension occurs commonly in patients with DM following a meal. The decrease in blood pressure can occur from 15 minutes to two hours after consuming a meal, and this drop in blood pressure is associated with an increase in falling, myocardial infarction, and syncope. It is possibly due to the release of a vasodilatory peptide hormone, calcitonin gene-related peptide, which causes pooling of blood in the periphery. The magnitude of postprandial hypotension can be attenuated by using drugs that delay gastric emptying and alter gut hormone secretion, such as acarbose and miglitol. In addition to postprandial hypotension, persons with DM are at increased risk of developing orthostatic hypotension. For this reason, all diabetic patients need to have their blood pressure measured when they are both lying down and standing up.

Diabetic patients have a high risk of developing foot ulcers and subsequently needing to have an amputation. For this reason, persons with DM need to pay careful attention to their feet. Lack of sensation increases the chance of damage occurring to their feet. Prevention and very early treatment of foot injuries are of the essence, as once an ulcer is well developed, reversal rates are quite low.

Peripheral neuropathy can be very painful for those with DM. Tricyclic antidepressants can reduce pain, but in older persons with DM, desipramine or nortriptyline should be used, rather than the more anticholinergic amitriptyline. Modern drugs with some efficiency against neuropathy may actually cause regrowth of nerves. Alpha lipoic acid appears to protect nerves in diabetic patients and reverse oxidative damage. Proximal neuropathies in diabetic patients are often not due to DM, but have other causes and should be fully investigated. (continued on page 6)
propriate exercises are a key to improving function.

Zinc deficiency occurs in about one in ten older diabetic patients. Patients with DM absorb zinc poorly. In addition, hyperglycemia leads to the loss of zinc through the urine. The role of zinc deficiency in the immune abnormalities that occur in diabetics and in poor healing of diabetic ulcers has not been determined.

Persons with DM are particularly prone to infection. Recurrence of tuberculosis occurs commonly in older diabetic patients.

Besides retinopathy, those with DM are more likely to develop cataracts and glaucoma, making visual loss a common problem in diabetic patients. Older patients with DM often develop “masked renal failure” as the loss of muscle leads to smaller-than-expected increases in serum creatinine. Cystatin C may be a better serum marker for renal failure in older patients with DM, but all persons with DM should have microalbuminuria measured at least every year.

Management of Diabetes

DIET: Studies in older patients with DM (those over 70 years of age) have shown that weight loss is associated with increased mortality. For this reason, the aim of the diet should be for weight stability. Addition of fiber to the diet to smooth out the glycemic index and to reduce the hyperlipidemia following a meal appears to be a reasonable approach. Addition of unsaturated fatty acids and particularly “fish oils” (omega-3 fatty acids) makes sense especially in persons with hypertriglyceridemia.

Dr. Syed Tariq and Carolyn Philpot have shown that DM diets do not improve outcomes in diabetic patients in nursing homes. Based on these findings, neither the American Diabetic Association nor the American Dietetic Association recommends a diabetic diet in institutionalized older persons. Because of the increased risk of injurious falls, all older diabetic patients should receive at least 1 gram of calcium and 800 IU of Vitamin D daily. 25(OH) Vitamin D should be measured in all older diabetics.

EXERCISE: Exercise, particularly resistance and balance exercises, need to be a part of the older diabetic’s lifestyle. Older patients with DM who fall need falls assessments and must be taught appropriate exercises in order to prevent future falls.

MEDICATIONS: There are now numerous medications available for the treatment of DM (see pages 12-13). Sulfonylureas still are a major class of drugs that enhance glycemic control by increasing insulin. They have a relatively high propensity to produce hypoglycemia. The newer, shorter-acting insulin secretagogues do not appear to produce less hypoglycemia and have the inconvenience of needing to be taken before each meal.

Metformin is an excellent drug for overweight diabetics. It appears to be less effective in older persons and should not be used in persons 80 years or older. Because of the “masked renal failure” that occurs with aging in persons over 70 years of age, in order to avoid the development of lactic acidosis, metformin should not be given when the serum creatinine is greater than 1.2 g/dl. Metformin is not used in hospital and when the person is receiving an anesthetic or radioiodinated contrast media.

The alphaglucosidase inhibitors, acarbose and miglitol, are drugs that slow glucose absorption, increase glucagon-like peptide I, an incretin (see page 22), and slow gastric emptying. They have been underused based on the fact that (continued on page 22)
1. Know your goals.
2. Goals and values must align.
   a. Know your own goals.
   b. Know the goals of your employer.
   c. Ensure that a and b mesh.
3. Develop key skills in
   a. Writing.
   b. Negotiation.
   c. Listening.
   d. Providing inspiration to others.
   e. Saying no.
4. Develop a plan.
5. Make progress on that plan.
6. Communicate constantly with others about
   a. Progress made.
   b. The failure to make progress.
7. Embrace change.
8. Use multiple mentors.
9. Give credit to others. (No one succeeds alone.)
    a. Work is only one aspect of life.

Remember: The joy and the rewards lie primarily in the journey rather than in the outcome.

By Neil Resnick, MD
Saint Louis University Team Assumes Leadership of the Journal of the American Medical Directors Association (JAMDA)

In January of this year, the editorial control of JAMDA moved from the editorship of Dan Osterweil at UCLA to an editorial team at Saint Louis University. This journal is the leading journal in the field of long term care. It is indexed in both Pub Med (Medline) and the IST index. The new editor is John Morley and the associate editors are Julie Gammack and David Thomas. As part of their role, the SLU team made presentations on “How to Publish in JAMDA” and “An Update in Geriatrics” at the Annual Meeting. For these presentations, they were ably assisted by Barbara Messenger-Rappaport of the Cleveland Clinic. The new editorial team has instituted a number of innovations in JAMDA in an attempt to make the Journal more clinician-friendly.

Dr. Gammack and Dr. Hajjar Receive HRC Awards

Dr. Julie K. Gammack received the inaugural Spirit of Service Award at the 2007 Health Resource Center (HRC) Auction on April 21, 2007. “It is fitting that Dr. Gammack receive the inaugural Spirit of Service Award, as she truly embodies the purpose of the HRC. Not only does she volunteer on a consistent basis, but she regularly makes contributions to the clinic outside of volunteering. Dr. Gammack has donated numerous supplies to the clinic, including baseboards which greatly improved the aesthetics of the clinic. Additionally, she is always willing to offer suggestions for improving the operations of the clinic and to serve as a sounding board for new ideas.”

Dr. Ramzi Hajjar was named the 2007 Physician Volunteer of the Year. “Dr. Hajjar is truly an asset to the HRC. He is very enthusiastic about teaching and takes time to ensure that every student volunteer understands the nuances of patient care. Multiple times, he has served as physician volunteer at the last minute when no other volunteers could be found. He works hard to boost the morale of the clinic volunteers through bringing treats and offering encouragement.”

Dr. Kevorkian Named Distinguished Teacher

The Distinguished Teacher Awards ceremony to honor the Saint Louis University Medical School educators in the M.D. curriculum was held Monday, April 30, 2007. Dr. Rafi Kevorkian was recognized for his Clinical Teaching. He received a distinguished teaching award medalion, commemorative plaque and $1,000 cash award. His photo will be hung in the Saint Louis University School of Medicine Learning Resources Center for one year. Congratulations, Dr. Kevorkian.

Dr. Ramzi Hajjar Receives Teaching Award

Ramzi Hajjar, MD, received the Saint Louis University Medical Student 2006-2007 Clinical Teaching Award. This award is given to the faculty member selected by the medical students for his dedication to teaching. His name will be added to a plaque in the Internal Medicine office that honors current and past recipients of the award. Excellent job, Dr. Hajjar!
You receive a late night call from your father’s nursing home. They have just sent your father to the emergency department because “he’s confused and agitated. He won’t stay in his room, so the doctor on call told us to send him in.”

When you get to the emergency department (ED), you agree that something is wrong. You tell the ED physician, “He’s just not right.” You explain that he’s been living in the nursing home for about six months, ever since the doctors thought it was too dangerous for him to live alone, due to his worsening dementia, caused by what the doctors said were ‘tiny strokes.’

After waiting four hours in the waiting room, the ED physician calls you back to where your father, who is now sleepy instead of agitated, lies on a gurney. The physician tells you, “We’ve done a CT scan of his brain, run all the blood tests, and tested his urine, and except for a small amount of bacteria and a few red blood cells in the urine, we can’t find anything wrong with him. I think he can go back to his nursing home because all of his vital signs are normal.”

All except one, which was not checked.

Had the ED physician checked the 6th vital sign, he would have recognized that something was wrong: the patient had delirium. Delirium is a clinical syndrome characterized by a sudden onset of impaired attention, disorganized thinking or incoherent speech, and a clouded consciousness. It is different than dementia, although those with dementia are at risk of developing delirium. Delirium almost always has multiple causes including medications or medical illnesses. It is (continued on page 10)
Mental Status (continued from page 9)

Differential diagnosis for patients with Delirium. Remember: Delirium usually has more than one cause.

associated with a decline in physical function, increased length of stay in-hospital, increased rates of discharge to a long-term care facility, increased hospital costs, and even increased mortality rates. Although it is a “bad” thing to have, if diagnosed, and the underlying causes are identified and treated, it is reversible more than 90% of the time. However, misdiagnosis or late diagnosis partly explains why delirium is associated with such adverse outcomes. In various clinical settings, including long-term care, emergency departments and hospitals, physicians fail to recognize delirium in 32% to 66% of patients and nurses fail to recognize it in up to 69% of patients.

Delirium can be found among nursing home residents (14-33%), among patients who are returning to nursing homes or to post-acute care facilities (such as “skilled nursing facilities”) after a hospitalization (23-72%) and among hospitalized patients (22-31%).

Thus, a vital sign that would alert health care professionals about a change in mental status could lead to an increase in recognition of delirium and improve outcomes.

Earlier this year, a Veterans Administration (VA) Delirium Working Group discussed strategies for doing this. Recognizing that several years ago, the VA promoted pain as the 5th vital sign, and now patients across all health care settings have their pain reliably recognized and addressed, the potential utility of introducing mental status as a vital sign was discussed. The full report of the Group appears in an editorial in the May issue of the Journal of American Medical Directors Association. The Group identified seven justifications, many of which were based on studies noted above, for making mental status the 6th vital sign:

- The brain is as sensitive and vital an organ as the immune (temperature), cardiac (pulse, blood pressure), and respiratory (respiratory rate) systems for heralding that something is amiss.
- Delirium is a common, morbid, and costly condition.
- Health care professionals frequently fail to evaluate mental status, and unrecognized delirium is one example of this.
- Communication about mental status across sites of care would improve.
- Widespread adoption would compel clinicians to become more diligent in their evaluation of the mental status as it relates to delirium and may lead to wider use of valid and reliable instruments used to evaluate patients for delirium.
- The morbidity associated with delirium and its underlying causes is best mitigated by early intervention.
- The elevation of mental status assessment and care to a quality measure will be facilitated.

Vital signs are defined as clinical measurements that indicate the state of a patient’s essential body functions. They can be observed, measured, and monitored. The Group proposed that the 6th vital sign should be based on the following two observed measures: Attention and Alertness.

Inattention is the cardinal cognitive impairment symptom of delirium. Several measures for the rapid assessment of attention are available, including just conversing with the patient and judging his/her attention as normal/abnormal; asking the patient to recite the
Mental Status (continued from page 10)

days of the week or the months of the year backwards, serial 7s; and the digit spans.

Alertness is easily and rapidly assessed, and is already an accepted part of physician and nursing assessments. For minimal effort on the part of the health care professional, it would add useful information to the vital sign, especially for patients with a baseline dementia.

So what would have happened to our patient above? First, without the 6th vital sign, the patient would have returned to the nursing home that night, maybe with antibiotics because of the bacteria in his urine, but without the correct diagnosis. He would have remained agitated off and on, leading to more problems for the nursing staff, possibly leading to use of medications to calm him, which might have lead to sedation, falls, and worse outcomes.

With the 6th vital sign, the nursing home report to the ED physician, in addition to temperature, pulse, blood pressure, and respiratory rate, would have had Mental Status: ATTENTION: abnormal; ALERTNESS: normal. The ED physician would then have rechecked the patient’s vital signs in the ED, including the patient’s 6th vital sign which may have changed while the patient was there from Mental Status: ATTENTION: abnormal; ALERTNESS: normal, to Mental Status: ATTENTION: abnormal; ALERTNESS: abnormal. This could have then prompted him to look a little closer for a medical cause of the mental status problem, or at least admit the patient for further evaluation. It turns out the patient had a kidney stone, but because of the delirium and his underlying dementia, he could not communicate that he was having pain. He was agitated only from time to time, which was his “pain equivalent.” The patient did not have fever (often older patients may not have fever even with infection), and his blood pressure and pulse were not elevated with the pain because he was on two anti-hypertensives, including a beta-blocker, which blocks the heart rate from going faster.

If the 6th vital sign had been identified as abnormal, the patient would have been admitted, people would have recognized, ‘this is delirium,’ careful attention to the management of delirium could have taken place, and a more in-depth work up would have diagnosed the kidney stone. Then, appropriate pain management would have been instituted, the kidney stone would have passed spontaneously or with the help of the urologists, and the patient would have returned not only to his nursing home, but back to his usual self, including his normal 6th vital sign: Mental Status: ATTENTION: normal; ALERTNESS: normal.

REFERENCES:
Diabetes and Half of All Diabetic Males

Prevalence of Diabetes Mellitus in the United States of America

Causes of Diabetes Mellitus in Older Persons

- Normal response
- Insulin
- Insulin resistance
- Non-insulin mediated glucose uptake
- Glucagon-like peptide
- Glucose inhibition peptide
### Medications

<table>
<thead>
<tr>
<th>Drug</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sulfonylureas</strong></td>
<td></td>
</tr>
<tr>
<td>Glyburide, Glipizide, Glimepiride</td>
<td>Increased risk of hypoglycemia.</td>
</tr>
<tr>
<td><strong>Biguanides</strong></td>
<td></td>
</tr>
<tr>
<td>Metformin (Glucophage)</td>
<td>Reduce acceptable serum creatinine to less than 1.2 g/dl. Do not use in patients over 80 years of age. Causes anorexia and weight loss.</td>
</tr>
<tr>
<td><strong>Thiazolidinediones</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Alphaglucosidase inhibitors</strong></td>
<td></td>
</tr>
<tr>
<td>Acarbose (Precose), Miglitol (Glyset)</td>
<td>Increase GLP-I. Decrease cardiovascular disease. Abdominal upset. Weight loss.</td>
</tr>
<tr>
<td><strong>Glucagon-Like Peptide I Agonist</strong></td>
<td></td>
</tr>
<tr>
<td>Exendin-4 (Byetta®)</td>
<td>Severe abdominal upset. Weight loss. Avoid in older persons.</td>
</tr>
<tr>
<td><strong>Dipeptidyl Peptidase IV Inhibitors</strong></td>
<td></td>
</tr>
<tr>
<td>Vildagliptin (Glavus®), Sitagliptin (Januvia®)</td>
<td>No hypoglycemia.</td>
</tr>
<tr>
<td><strong>Meglitinides</strong></td>
<td></td>
</tr>
<tr>
<td>Repaglinide (Prandin®)</td>
<td>Three times a day. Hypoglycemia.</td>
</tr>
<tr>
<td><strong>D-Phenylalanine Derivatives</strong></td>
<td></td>
</tr>
<tr>
<td>Nateglinide (Starlix®)</td>
<td>Three times a day. Hypoglycemia.</td>
</tr>
<tr>
<td><strong>Orlistat</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Insulins

<table>
<thead>
<tr>
<th>Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rapid-acting</strong></td>
<td>Lispro (Humalog®), Aspart (NovoLog®) 15-minute onset. 3-5 hour duration.</td>
</tr>
<tr>
<td><strong>Short-acting</strong></td>
<td>Regular insulin (Humulin R, Novolin R) 30-60 minute onset. 5-8 hour duration.</td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td>Insulin, human isophane (Humulin N, Novolin N) 1-3 hour onset. 20 hour duration.</td>
</tr>
<tr>
<td><strong>Long-acting</strong></td>
<td>Glargine (Lantus®) 1 hour onset. 24 hour duration.</td>
</tr>
<tr>
<td></td>
<td>Insulin detemir (Levemir®) 1 hour onset. 14 hour duration.</td>
</tr>
</tbody>
</table>
station back at the nursing home with music, balloons, candy, and roses. However, as residents were returning home, another storm hit St. Louis and power was off again! Because temperatures were expected to be lower over the upcoming weekend, we keep the residents at the nursing home, despite the blackout.

Lessons Learned

The mayor, governor, national guard, and Red Cross were overwhelmed by other requests and could provide little help to us. Therefore, it was critical to encourage our own staff and family members to help out. It helped to provide encouragement, treats, and (continued on page 15)
bottled water. Similarly, police and ambulance workers needed to be treated well. We kept the Missouri Board of Nursing Home Directors’ office informed.

**Critical Concerns**

The following concerns were identified during the evacuation:

- Security of medicines, storage boxes, and medicine carts.
- Staff transportation
- Transportation of laundry and supplies
- Elopement concerns
- Caring for half of our residents on a gym floor
- Privacy
- Community members wanting to use our space
- Finding correct cushions for residents
- Keeping accurate track of staff time
- Police using our space in the community center as a cooling station

**Keys to Success**

A key factor in our success was a well-written (personalized) Disaster Manual. A similar Disaster Manual was key for the successful survival of patients during another power outage at another NHC facility during an ice storm three months after our summertime power loss. Pre-planned services made our task easier. However, reacting quickly and appropriately to situations as they arose was an important component and this required managers to work excessively long hours. Helping the staff and residents to keep a positive attitude played a major role in our success. This situation truly exemplifies that success requires that “There was no ‘I’ in ‘team’.” Disasters are a superb team-building exercise but one can never be totally prepared and that’s where “team-think” saves the day.

The great staff of National HealthCare of Maryland Heights made all the difference in this potential disaster. Each member played a part in keeping residents safe and calm. Hats off to the team!
Saint Louis University Invests in a Center for Aging Successfully

New centers of excellence at Saint Louis University are part of a $1 million academic initiative designed to strengthen areas where SLU already has national prestige and recognition.

In November, University President Lawrence Biondi, S.J., approved $1 million in seed money for efforts involving different departments coming together to work on similar topics. In all, 19 applications were submitted for the initiative and four centers were funded, including one in aging.

The Center for Aging Successfully will build on the existing strengths of top-notch SLU scientists and researchers who study aging by encouraging collaborative efforts across various disciplines. For the last decade, Saint Louis University School of Medicine has been consistently recognized by US News & World Report as having one of the best geriatrics programs in the country. The Center for Aging Successfully will provide education on multiple levels -- from the lay public through community education programs to University students at all degree levels to health providers working in local hospitals and community health centers. The center also will provide state-of-the-art services to enhance the quality of clinical care for the elderly. The center is a collaborative project between the School of Medicine, Doisy College of Health Sciences, School of Public Health, College of Public Service, Graduate School and College of Arts and Sciences. Principal investigators include John Morley, M.B., B.Ch. (geriatrics), Nina Tumosa, Ph.D. (geriatrics), and Susan Tebb, Ph.D. (social work).

GERIATRIC TEACHING CDs AVAILABLE

• Emergency Preparedness
• Palliative Care
• Geriatric Dermatology
• Cognitive Impairment

This 4-CD set contains multiple PowerPoint presentations on the four topics listed above. Import individual slides into your current lectures or use the talks in toto.

Send $30 (includes shipping) to:
Saint Louis University School of Medicine Division of Geriatric Medicine
1402 South Grand Boulevard, Room M238
St. Louis, MO 63104.

Make checks payable to SLU Geriatrics.
THE ESSENTIAL HERB-DRUG-VITAMIN INTERACTION GUIDE: 
The Safe Way to Use Medications and Supplements Together

It’s estimated that 60 million Americans take herbs, vitamins, and other supplements seeking relief from such common ailments as headaches, back pain, arthritis, insomnia, depression, menstrual difficulties, menopausal symptoms, and sexual difficulties. Fifteen million of these people are also taking prescribed and over-the-counter medications, putting them at risk of experiencing dangerous herb-drug interaction.

Did You Know….
- Taking Echinacea and Tylenol together can severely damage the liver?
- Taking St. John’s Wort for depression while on birth control pills can cause breakthrough bleeding and unplanned pregnancy?
- Drinking green tea for an upset stomach can lead to false-positive results on some tests for cancer?

In THE ESSENTIAL HERB-DRUG-VITAMIN INTERACTION GUIDE The Safe Way to Use Medications and Supplements Together, on sale everywhere April 17, 2007, Dr. George Grossberg of the St. Louis School of Medicine, and Barry Fox, Ph.D., show consumers how to protect themselves from herbs that weaken or magnify the effects of prescription drugs, vitamins that change test results, and supplements that make diseases worse.

While herbs have been used across the globe for thousands of years and have proved effective in relieving numerous ailments when taken properly, most people lack a clear understanding of how they work. Written in a user-friendly, accessible style, THE ESSENTIAL HERB-DRUG-VITAMIN INTERACTION GUIDE is organized in alphabetical order by herb, and provides detailed information for each supplement profiled, including recommended dosages, contraindicated drugs, history and usage, lab test results that may be altered by use of a supplement, diseases that a supplement may worsen, and food/beverage interactions to watch out for. Comprehensive in scope, THE ESSENTIAL HERB-DRUG-VITAMIN INTERACTION GUIDE is an invaluable resource for taking herbs and vitamins safely that will make it easy for anyone to instantly locate and understand what they need to know.

About The Authors:

George T. Grossberg, M.D., is a professor of geriatric psychiatry at St. Louis University School of Medicine. He has been cited by his peers in Best Doctors in America and America’s Top Docs since their inception.

Barry Fox, Ph.D., is the bestselling author and coauthor of numerous health books, including the New York Times number-one bestseller The Arthritis Cure, as well as The Side Effects Bible and Alternative Cures That Really Work.

For more information, please visit the book’s website at: http://www.herbdrugvitamin.com.

The Essential Herb-Drug-Vitamin Interaction Guide
The Safe Way to Use Medications and Supplements Together
by George Grossberg, M.D., and Barry Fox
A Broadway Books Trade Paperback Original
$18.95/$24.95 in Canada
On Sale April 17, 2007 • Available wherever books are sold.
www.herbdrugvitamin.com • www.broadwaybooks.com
A comprehensive review of the current state of nutritional science for the elderly

In a vicious cycle, poor nutritional health leads to acute and chronic disease, and disease states are catastrophic to nutritional health. The magnitude of nutritional depletion from any cause depends on the extent to which the nutritional reserves an individual has accumulated over time. In our increasingly older population, nutritional reserves are marginal and the magnitude of the effect on nutritional health is amplified. Strategies to improve nutritional health in older individuals require a unique approach and sensitivity to the individual's needs.

Drawing from a group of outstanding experts in the field, *Geriatric Nutrition* is a state-of-the-art review of current nutritional thinking. Beginning with an overview of nutrition in older persons, the book addresses nutrition epidemiology, obesity, and immunity, as well as molecular theories of aging. A detailed scientific review of nutritional requirements follows with chapters on energy balance, water metabolism, vitamin disorders, and trace elements. Techniques for the clinical assessment of nutrition in older adults integrate comparisons between US and European Union strategies and standards. The book includes a covering section on the management of undernutrition in nursing homes and assisted living environments. It offers prescriptions for enteral and parenteral nutrition, as well as protein energy undernutrition. A significant portion of the book covers nutritional recommendations in specific disease states, including psychological issues such as dementia and depression, cancer, diabetes, anemia, and fracture risk. The book also considers multicultural and ethical issues relevant to the care of the elderly.

Exploring exciting new ideas in normal, pathological, and optimal nutrition, *Geriatric Nutrition* ties basic research with clinical practice to further the understanding of nutrition in older persons.

**FEATURES**

- Presents basic knowledge, current clinical practice, and future ideas for geriatric nutrition
- Reviews nutritional status, assessment, and requirements in older people
- Provides specific data on the management of diabetes, obesity, depression, dementia, and cardiovascular disease
- Considers ethical and cultural issues
- Offers prescriptions for enteral and parenteral nutrition

---

**CONTENTS**

The Aging Society and Nutrition Epidemiology

Molecular Theories of Aging and Nutritional Interventions

The Role of Nutrition in the Prevention of Age-Associated Diseases

Obesity in Older Adults

Sarcopenia and Cachexia

Immunology and Nutrition

Nutritional Requirements in Older Adults

Energy Balance

Water Metabolism

Vitamin Disorders

Trace Elements

Nutritional Assessment in Older Persons

Geriatric Assessment and Its Interaction with Nutrition

Nutritional Assessment in the European Community

The Oral Cavity and Nutrition

Management of Protein Energy Undernutrition in Older Adults

Prescription for Enteral Nutrition

Prescription for Parenteral Nutrition

Nutrition Management in Nursing Homes

Providing Optimal Nutrition in the Assisted Living Environment

Nutritional Factors in Dementia

Nutrition and Depression

Nutrition and Behavior

Nutritional Management of Hypertension

Nutrition and Cancer: Some Practical Approaches to Management

Nutrition and Type 2 Diabetes Mellitus in the Geriatric Patient

COPD and Undernutrition: A Complex Interaction

Nutrition and Castroviejo's Function

Drug-Nutrient Interactions

Nutrition and the Endocrine System

Nutritional Anemia in Older Persons

The Role of Nutrition in Prevention and Management of Pressure Ulcers, D.R. Thomas

Nutrition and Fracture Risk

Multicultural Issues

Choice and Nutritional Ethics, Issues Index
On any given evening, in any given emergency department (ED) across America, it would not be unusual to find a man in his early eighties with diabetes and heart problems who was in a motor vehicle accident (MVA) and fractured his arm, or a presumably healthy woman in her seventies who fell at home and broke her wrist, or a woman with as yet undiagnosed Alzheimer’s in her nineties who fell while at her daughter’s house and broke her hip.

The usual would happen. The orthopedic surgeons would be called. Bones would be fixed. The first two patients would most likely be sent back home, and the third patient would be admitted, medically evaluated for operative risk, decisions about surgery would be delayed because of her age, and finally, after surgery, and hopefully after surviving post-operative delirium, (something many physicians and nurses might consider just part of the risk of doing surgery in this age group), she would go to a skilled nursing facility, and likely require long term care in a nursing home.

But if these patients came to the Saint Louis University Hospital Emergency Department (ED), the usual would be the unusual. The Silver Team, made up of an attending geriatrician and a geriatric fellow, would be called. What initially began as a limited orthopedic-geriatric hip fracture service has grown into the Silver Team, a comprehensive geriatric consult and/or inpatient service, depending on the needs of the patient, for older persons with any broken bones.

What most feared would turn into an abuse of the geriatrics service by the orthopedic residents, who wrongly have the reputation of “all we want to do is fix bones and not take care of patients,” has turned into a working relationship that is educational for both groups and a needed service for older patients for whom a broken bone is sometimes a red flag that something else is going on. So now, any time orthopedic residents are called to the ED (residents are called first because SLUH is an academic teaching hospital), if the patient is “older,” they will consider calling the Silver Team. In fact, “call if a fall” has become the recent slogan to spread the news that the geriatricians want to be involved.

(continued on page 20)
Steps in the process:

1. Understanding (and helping the geriatric fellows understand) that the call from the orthopedic residents from the ED is an opportunity to build the geriatric-orthopedic relationship, not an attempt on the part of the surgeons to get rid of the patient.

2. Relationship-building comes before education. This is difficult because in large teaching programs, residents and fellows rotate as often as every month among different hospitals, so camaraderie may not happen, but respect for what the other can bring to the patient can.

3. Trust among the orthopedic attendings and geriatric attendings. This is also a process, since there are many of each, but what helps is to have one leader in each group commit to the idea, and have frequent communication. How can this be done if both are busy? One day per week, the leader geriatrician attends the surgeons daily 30 minute morning X-ray rounds. A once-a-week presence is enough to troubleshoot, gain trust, reiterate the goals of the service when necessary, and show commitment, (especially since the X-ray rounds are at 6:30 in the morning).

4. Prevent turf wars by having the initial decisions about which service the patient will be under (e.g., under orthopedics with the Silver Team consulting, or under the Silver Team with orthopedics consulting) made by an attending. This seemingly paternalistic approach allows the residents and fellows to spend time focused on the patient, and thus learning, instead of spending time waging turf battles.

5. Education, and improved patient outcomes will happen. It will happen as a consequence of the relationship and putting the patient at the center of the program.

So what unusual and unique outcomes happened to our patients above? The first patient, although only having a blood sugar of 200 in the ED, was found during geriatric assessment to have very poor vision, peripheral neuropathy, and depression, all of which led to
The Silver Team
(continued from page 20)

Dr. Joseph H. Flaherty is Associate Professor of Medicine in the Division of Geriatric Medicine, Department of Internal Medicine, at Saint Louis University School of Medicine. His willingness to find innovative solutions has led to Saint Louis University Hospital and Des Peres Hospital each opening an ACE (Acute Care for the Elderly) Unit, and now adding “The Silver Team” to their consult services called to see elderly patients.

this MVA, his second in 2 months. Since his wife died a year ago, he had stopped going to his primary doctor. One follow up visit with the geriatricians identified a hemoglobin A1c (HbA1c) of 12 mg/dl, orthostatic hypotension but improved depressed mood, and a willingness to see the ophthalmologist.

The ED physician, who had not run any tests, planned to send the second patient home after the orthopedic surgeons casted her arm, but she refused to go home because she was afraid of falling again. That’s when the unusual happened. The orthopedic resident said, “Why don’t you call geriatrics?” This call led to a discussion of why the patient, who had never fallen in her home, fell now. Was something wrong? Further evaluation, including routine blood and urine tests, revealed a HbA1c of 6 mg/dl and a urinalysis with over 300 white blood cells and many bacteria.

The third patient was admitted that evening and had her geriatric assessment the next day. She had a baseline functional ADL status of completely independent although her SLUMS exam score was only 12/30. She went to surgery the following day, with careful attention to pre-op and post-op medication use, good control of pain with a bowel regimen, immediate discontinuation of the operative Foley catheter, and close attention for early signs of delirium, which she did not develop. She was discharged to a skilled nursing facil-

ity and stayed two weeks before returning home with a fall alert and hip protectors. The two female patients received treatment for their osteoporosis, and the older man had further evaluation for osteoporosis.

Although the Silver Team is still young, it represents a unique model of care for the older person who comes to the hospital with an orthopedic problem. Whether the problem is the classical hip fracture, or a fracture due to some underlying illness that may often be overlooked, the Silver Team will be there, to find the unusual, and to make the highest standard of care usual.
they produce gastrointestinal side effects. They do not produce hypoglycemia.

Glucagon-like peptide I (GLP-1) is an incretin (see figure below). Incretin hormones are substances that are released from the gut and increase insulin secretion. It also has a variety of other effects that are salutary for persons with DM, such as slowing gastric emptying, decreasing glucagon, and producing anorexia. GLP-1 levels are decreased in persons with DM. Exenatide (Byetta®) is an injectable compound obtained from the skin of the gila monster which acts like GLP-1. While it has numerous gastrointestinal side effects, it has been very useful for the treatment of some obese middle-aged diabetic patients.

Recently, two drugs have been developed that block the breakdown of GLP-1 and another incretin, Glucose Inhibitory Peptide. These drugs do not produce hypoglycemia and enhance glucose control. They are called sitaglaptin (Januvia®) and vildagliptin (Galvus®).

Another of the classes of drugs for treating diabetes are the thiazolidinediones. These drugs work through the PPAR gamma receptor. The two drugs in this class are pioglitazone hydrochloride (Actos®) and rosiglitazone maleate (Avandia®). They do not produce hypoglycemia, acting mainly on muscle to reduce insulin resistance. They do cause water retention and, therefore, liver function needs to be monitored.

Numerous insulins are now available to treat diabetic patients. When adequate diabetic control cannot be obtained with oral agents, the use of insulin should not be avoided. The use of the long-acting insulin, glargine (Lantus®), at 10 to 15 units in the evening will often allow smooth glucose control in combination with an oral agent during the day. Inhalation insulin represents an alternative for those who cannot inject themselves.

**Conclusion**

There have been exciting developments in the ability to manage DM in older persons over the last decade. These have been coupled with an increased awareness of the special problems faced by older persons with DM. There is a particular need for health professionals to increase their awareness of the health literacy needs of older patients with DM. The ideal HbA1c level for an older person has not been determined. However, in healthy, non-frail elderly persons, a target value of 7% seems reasonable. In frail and demented persons, 7.5% may be more realistic. In addition, it should be recognized that the United Kingdom Prospective Diabetes Survey demonstrated the importance of controlling high blood pressure in diabetic patients.

**REFERENCES**

UPCOMING CONTINUING EDUCATION PROGRAMS

5th Annual
Western Missouri
Geriatric Research,
Education, and Clinical
Center (GRECC)
Symposium
October 5, 2007
Kansas City, Missouri

Sixth World Congress
The Aging Male
February 21-24, 2008
Tampa Bay, Florida USA

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

19th Annual
SLU School of Medicine
Symposium for Medical
Directors
and the
27th Annual
GRECC Conference
December 1, 2007
St. Louis, Missouri

For more information
about these conferences,
contact
314-894-6560.
Moving?

Please fax the mailing label below along with your new address to 314-771-8575 so you won't miss an issue! If you prefer, you may email us at aging@slu.edu. Be sure to type your address exactly as it appears on this label.