A wealth of evidence suggests that exercise and physical activity ameliorates diseases and delays disability in the older population (Christmas & Andersen, 2000). The evidence shows that even octo- and nonagenarians can be trained in endurance and strength exercises to receive considerable health benefits. Endurance training can maintain and improve cardiovascular function and can reduce risk factors associated with chronic illnesses. Strength training offsets muscle loss that is commonly seen in the elderly. Both endurance and strength training can greatly improve the functional ability and quality of life of the frail elderly (Mazzeo et al., 1998). However, for the frail elderly, health care professionals should be aware of a number of considerations. In this article we will discuss safety issues for the frail elderly, both before and during... (continued on page 2)
ing exercise, contraindication to exercise, and guidelines for making exercise prescriptions.

Safety

There is considerable debate about just how many tests the frail elderly should undergo before they begin an exercise program. Two national organizations have established criteria for screening prior to beginning an exercise program, American College of Sports Medicine (ACSM, 2000) and the American Heart Association (AHA; Fletcher et al., 2001). These guidelines are similar in that each organization recommends that exercise stress testing should be done before sedentary older adults start a vigorous exercise program, even in the absence of known cardiovascular disease (Gill et al., 2000). However, Gill and colleagues (2000) argue that these guidelines are not applicable for older adults because the conditions for recommending exercise stress testing are too vague. Also, the distinction between moderate and vigorous exercise is open to interpretation. Although these organizations may specify intensity as being a proportion of oxygen consumption (VO₂max), it is extremely uncommon for frail older adults to be able to reach their VO₂max with the usual exercise stress testing. Considering that most frail older adults have at least one chronic medical condition, few are capable of starting a vigorous exercise program. The most practical method to monitor intensity for the frail population is by using the ratings of perceived exertion (RPE)(See Table 1 on page 18). RPE uses a scale from 6 to 20 to allow exercisers to subjecitvely rate their exertion level during exercise (ACSM, 2000). RPE is especially useful for the frail elderly because many take medications that alter the physiologic response to exercise. Gill and colleagues further argue that given the large number of older adults with asymptomatic cardiovascular disease, routine exercise stress testing would likely lead to “a cascade of increasingly invasive cardiac procedures” which places these individuals at unnecessary risk of iatrogenic complications. After reviewing the findings of previous studies with older adults, they concluded that moderate exercise three days a week throughout the year only negligibly increased older adults’ risk of myocardial infarction and that regular exercise may actually reduce their risk of myocardial infarction and death by improving their cardiovascular risk factors and physical fitness.

Contraindications to exercise

In spite of this negligible risk in older adults, ACSM (Mazzeo et al., 1998) and Shephard (2000) outline several contraindications to exercise. Absolute contraindications to exercise testing and training include (Mazzeo et al., 1998):

- recent ECG changes or myocardial infarction
- unstable angina
- uncontrolled arrhythmias
- third degree heart block
- acute congestive heart failure.

Shephard (2000) recommends that older adults permanently avoid vigorous exercise if they have:

- an inoperable and enlarging aortic aneurysm
a malignant arrhythmia induced by exercise
severe aortic stenosis
end-stage congestive heart failure
severe behavioral agitation induced by exercise.

Relative contraindications include elevated blood pressure, cardiomyopathies, valvular heart disease, complex ventricular ectopy, and uncontrolled metabolic diseases (Mazzeo et al., 1998). Shephard (2000) recommends careful evaluation before such contraindications as:

- acute febrile illness
- unstable chest pain or congestive heart failure
- poorly controlled diabetes
- severe hypertension
- severe asthma
- acute musculoskeletal pain
- repeated falling episodes.

Finally, temporary contraindications include hernias, cataracts, retinal bleeding, and joint injuries (Mazzeo et al., 1998; Shephard, 2000).

Because sedentariness generally appears to be a far more dangerous condition than physical activity in the very old (Mazzeo et al., 1998), elderly people who wish to begin a light-to-moderate exercise program should be encouraged to do so without preliminary triage or special medical clearance. These are not only unnecessary but are also negative motivators. Thus, older adults should progress slowly by engaging in a little more exercise than during the previous week (Shephard, 2000).

Exercise prescription

Exercise goals for the frail elderly are different from those for younger adults for whom exercise helps prevent disease and increase life expectancy. In the frail elderly, exercise has three different goals: to minimize the effects of aging and chronic diseases; to reverse the effects of disuse; and to maximize psychological health (Mazzeo et al., 1998). Health care professionals working with the frail elderly need to clearly understand these differences and focus on the unique needs and concerns of these older individuals.

To effectively tailor an exercise program to the frail elderly, health care professionals should be aware of the exerciser’s:

- medical history
- lifestyle
- current activity level
- interests
- equipment and facility availability
- modes of transportation
- health and orthopedic limitations
- financial status.

The most effective exercise programs are those that are realistic, start with short-term goals, and progress slowly.

Several modalities are involved for a well-rounded exercise program for the frail elderly. These include:

- stretching
- resistance or strength training
- aerobic or endurance training
- balance exercises.

Frequency, intensity and duration also should be considered when introducing each of these modalities.

Stretching improves tendon flexibility, joint range of motion, and function and muscular performance (Pollock et al., 2000). Health care professionals should teach the frail elderly to isolate and stretch specific muscles. Older adults should use slow movement such as static stretches to a point of mild discomfort but not pain. Stretches should be sustained for 10 to 30 seconds and repeated 3 to 4 times for a total of up to one minute for each muscle group. Stretching exercises should be performed a minimum of 2 to 3 days per week and can be included in the warm up and cool down phases of resistance or endurance exercises (ACSM, 2000; NIA, 1999).

Resistance (or strength) training helps maintain and improve muscular strength and endurance, which helps to prevent falls, improve mobility, and reverse frailty. Improvements in strength will help the frail elderly with routine functional activities such as gait and balance, rising from a chair, climbing stairs, and performing aerobic activities, as well as improving psychological aspects such as morale and depression. Increased strength also improves energy intake.

Resistance training should expose the muscle tissue to a
(continued on page 18)
Saint Louis University
Mental Status (SLUMS) Examination

Name ____________________________ Age ____________
Is patient alert? ____________________ Level of education ____________________

1. What day of the week is it?
2. What is the year?
3. What state are we in?
4. Please remember these five objects. I will ask you what they are later.
   Apple  Pen  Tie  House  Car
5. You have $100 and you go to the store and buy a dozen apples for $3 and a tricycle for $20.
   How much did you spend?
   How much do you have left?
6. Please name as many animals as you can in one minute.
   0-5 animals  1  5-10 animals  2  10-15 animals  3  15+ animals
7. What were the 5 objects I asked you to remember? 1 point for each one correct.
8. I am going to give you a series of numbers and I would like you to give them to me backwards.
   For example, if I say 42, you would say 24.
   87  649  8537
9. This is a clock face. Please put in the hour markers and the time at ten minutes to eleven o’clock.
   Hour markers okay
   Time correct
10. Please place an X in the triangle.
   Which of the above figures is largest?
11. I am going to tell you a story. Please listen carefully because afterwards, I’m going to ask you some questions about it.
    Jill was a very successful stockbroker. She made a lot of money on the stock market. She then met Jack, a devastatingly handsome man. She married him and had three children. They lived in Chicago. She then stopped work and stayed at home to bring up her children. When they were teenagers, she went back to work. She and Jack lived happily ever after.
   What was the female’s name?
   When did she go back to work?
   What work did she do?
   What state did she live in?

<table>
<thead>
<tr>
<th>Score</th>
<th>High School Education</th>
<th>Less than High School Education</th>
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</thead>
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<td>20-30</td>
</tr>
<tr>
<td>20-27</td>
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<td>14-19</td>
</tr>
<tr>
<td>1-19</td>
<td>Dementia</td>
<td>1-14</td>
</tr>
</tbody>
</table>
The concept of frailty is one that has proved difficult to define. Most clinicians, and for that matter, many of the public can recognize a frail elderly person when they see them. However, when asked to provide the characteristics that make a particular person frail, they are often at a loss.

Recently, Fried and her colleagues have attempted to provide an occupational definition of frailty. They suggest that if a person has three or more of five factors, they should be considered frail. These factors are:

- Unintentional weight loss (10 pounds or more in a year)
- Self-reported exhaustion
- Weakness as measured by grip strength
- Slow walking speed
- Low physical activity.

Using this definition, they found that 6.9% of a community-dwelling population was frail. The Fried frailty phenotype predicted falls, deteriorating mobility, disability, hospitalization, and death. This form of frailty is associated with cardiovascular disease, low education, and a low income.

The Fried framework allows us to determine the pathophysiology of frailty. It places frailty in an intermediate position between being functional and developing functional impairment and/or comorbidity directly associated with a disease process. We must recognize those physiological factors whose deterioration may be due to environmental stressors or to preprogrammed aging factors. These factors play a central role in the development of frailty. This is troublesome to some geriatricians as has been elucidated by Muriel Gillick of Harvard.

Numerous factors play a role in the development of frailty. These include:

- Anorexia
- Sarcopenia
- Immobility (decreased physical activity)
- Atherosclerosis
- Balance impairment
- Depression
- Cognitive impairment.

It is now well recognized that older persons develop a physiological anorexia of aging. When they develop disease processes, this results in the onset of chronic undernutrition resulting eventually in fatigue, weakness, cachexia, and micronutrient deficiencies. At a basic biochemical level, testosterone deficiency, excess leptin production, and cytokine excess can aggravate this anorexia.

Sarcopenia is defined as an excessive loss of muscle associated with aging. While genetically preprogrammed to some extent, a variety of factors appear to be key to this accelerated muscle loss. They include decreased physical activity, testosterone and growth hormone deficiency, and decreased neuronal endplate input into muscles. Mild cytokine excess appears to also play a role in sarcopenia, whereas severe cytokine excess leads to cachexia.

Immobility can be caused by illnesses such as arthritis which decreases the ability to move a joint or by pain limiting mobility. Illness can also result in fatigue. The use of physical restraints has long been an inappropriate method to produce immobility iatrogenically. Osteoporosis can lead to hip fracture, starting a cycle of immobility leading to frailty.

Atherosclerosis can lead to frailty by reducing cardiac function resulting in a decline in VO$_2$ max. It can also lead to cognitive impairment secondary to small strokes. Atherosclerosis in the lower limbs (i.e., peripheral vascular disease) can result in sarcopenia secondary to nutrient deprivation of the muscles and slowed walking speed due to intermittent claudication.

Balance deteriorates over the lifespan. Decreased balance results in falls, leading to a fear of falling and decreased mobility with a worsening of frailty. Animal studies have shown a decline in beta-adrenergic input into the cerebellum. The good news is that animal studies have shown that exercise can lead
myths. Many of these myths have been endowed with the blessing of gerontologists. Perhaps the most enduring of these myths is that some ancient societies treated their elderly much better than we do in modern America. The reality of course is that some people in all groups treat their elders better than others and highly functional elders are appreciated, and therefore, supported, by all societies. It is useful to remember that the frail elderly of some of the indigenous people of the Americas were encouraged to embark on a lonely journey into the desert, the more barbarous equivalent of modern day euthanasia. I have seen many families who have insisted on caring for an elder at home, but whose care has been far inferior to that I’ve seen in the worst institutions.

Modern mythology of aging conceives of the golden years as successful aging or even aging successfully. These concepts suggest that the end of the journey of life will be one of great joy and health, where the older person can obtain the just rewards bestowed on those who deserve them. Younger scientists gather data on those who have lived to an extreme old age with minimal deterioration and then create a statistical picture of those behaviors that will allow the future generations to successfully age. Unfortunately, the clinical significance of these dictums, e.g., will I live a day, a week, or a year longer, is rarely discussed. These epidemiological paragons of virtue rarely find any enjoyable behaviors that will extend life. Somehow, the fact that lifespan increased by almost 30 years during the twentieth century, while the population became historically the most obese population of all ages is ignored.

Mythology, even when scientifically created, requires an element of suffering if the attained reward is perceived to be worthwhile!

Another modern mythology is that perpetuated by the “anti-aging” doctors. This is a field littered with truths, half-truths, and downright lies. Thus growth hormone has been shown scientifically to increase muscle mass but not strength, and to produce a variety of negative side effects. Despite this, it is touted as a cure-all to prevent frailty in older persons. DHEA, a substance which has been shown to produce minimal effects in older persons, is widely accepted as a fountain of youth. I recently listened to a lecture at the Third World Congress of Aging Men by a Harley Street physician who had given testosterone to a large number of aging men for a variety of symptoms regardless of whether or not they had a low testosterone level. As an advocate of the judicious use of testosterone replacement in older hypogonadal men, I was aghast at this “doctor for profit’s” cavalier approach to older males.

Another modern myth is that created by the American Legal System. The concept is that as soon as a frail elderly person is institutionalized, they will be protected from all harm. Thus, should they fall and fracture a hip, develop a pressure ulcer, or suffer any other injury, they are in no way responsible for any actions that led to their injury. This is the true meaning of institutional care. It is a euphemism for neglect. Yet, this is what many of our elderly are subjected to. This is the reality of modern American geriatric care.
A Brief Summary of the Progress of the Gateway Geriatric Education Center

The Gateway GEC was first funded in 1991. Over the last decade our GEC has had special foci on utilizing gaming for gerontology education, total quality management, internet dissemination of distance learning, and the development of a high quality newsletter (Aging Successfully) for the dissemination of gerontological knowledge. We educate 23 health professional disciplines ranging from physicians to policemen.

Our consortium members currently include Saint Louis University in St. Louis, Missouri; Rush-Presbyterian-St. Luke’s Medical Center in Chicago, Illinois; Kirksville College of Osteopathic Medicine’s Area Health Education Center in Kirksville, Missouri; the Logan College of Chiropractic in Chesterfield, Missouri; Lewis and Clark Community College in Godfrey, Illinois; the St. Louis College of Pharmacy in St. Louis, Missouri; the GRECC at the St. Louis VA Medical Center; the School of Optometry at the University of Missouri-St. Louis; Southern Illinois University at Edwardsville, Illinois; and the University of Illinois at three campuses: Chicago, Springfield, and Urbana-Champaign.

Games as Educational Tools
Our GEC has developed a variety of educational games:
- Geropady (CD-ROM and board based)
- Testostrix (CD-ROM based)
- Senior Safety Solitaire (board based)
- Polypharmacy Game (interactive)
- Crossword Puzzles (booklet)
- Longevity (Internet based)
- Challenges & Choices (board based).

Aspects of these games have been presented at the last two International Gerontological Meetings (Adelaide and Vancouver).

Total Quality Management (TQM)

Subsequent to this, we have developed a variety of TQM tools for nutrition management for use in nursing homes. These have been introduced in a number of nursing homes and have been the subject of a number of publications. We provide regular seminars on TQM. Most recently, together with Gerimed® we have developed the Glidepaths, which are critical pathways for the outpatient care of older persons.

Distance Learning
Together with a private company, GEC faculty have developed two cyber sites: www.cyberounds.com (for health professionals) and www.thedoctorwillseeourown.com (for consumers).

Our GEC faculty is responsible for producing and maintaining the geriatric/senior areas of these websites which include lectures and a question and answer section. In addition, the game Longevity, which has been played by over 2,000 health professionals, is on this site (sponsored by Novartis – it also appears on the Novartis Foundation site).

We also provide regular teleconferencing (both TV and audio). This is supported by the Veterans Administration and the pharmaceutical industry. Recent teleconferencing topics include pain and nutrition. Last year, with pharmaceutical company sponsorship, we developed a TV-satellite based educational piece on “The Andropause” and an accompanying press kit. These two items had 81,000 hits last year.

Lewis & Clark Community College continues to provide a certificate in geriatric case management via the Internet.

Scholars Program
The scholars program is the basis of our program for individual health practitioners. Health practitioners develop a 160-hour individualized program with a faculty mentor. This includes attendance at clinics, on the ACE and GEM units, at our sub-acute care site and a variety of nursing homes and assisted living centers. We also have a distance telemedicine demonstration program. There is an emphasis on involvement with interdisciplinary (continued on page 8)
teams. In addition, scholars attend our conferences. They then return to their own site and with help from our faculty, develop an educational experience based on our training. To date, we have trained 254 scholars.

Aging Successfully
Our newsletter has been in production for 12 years. It is distributed to between 20,000 and 50,000 health professionals, depending on the topic.

Conferences
We provide three major conferences each year – the Saint Louis University Summer Geriatric Institute, now in its 13th year with an average attendance of 300; a Nursing Home Administrators Conference, in its 14th year, attendance of 100; and a topic-specific conference in collaboration with the GRECC (last three topics were Nutrition, Pain, and in collaboration with Logan College of Chiropractic, Complementary and Alternative Medicine). The GRECC conference is in its 22nd year, with an average attendance of 100. These conferences have resulted in the publication of 9 books. All conferences also have a comprehensive educational syllabus.

In addition, we do a variety of other conferencing where we take the educational offering to the health practitioners, e.g., we have a program for CNAs in rural southern Illinois and we have provided 21 nutrition lectures at sites ranging from San Francisco to Atlanta for physicians, dietitians, and nurse practitioners. This latest endeavor was organized with an unrestricted industry grant for $300,000.

University Coordination and Faculty Development
GEC faculty coordinates geriatrics/gerontology development through the Interdisciplinary Committee for Geriatrics/Gerontology (ICGG). The efforts of ICGG faculty have provided University-wide education in gerontology for all schools, opportunities for faculty development and a forum for education. An example of our successful penetration is that in 2001, 81% of our medical school graduates felt that they learned about the health care needs of older adults, compared to a 69% average nationwide.

Community Outreach for Consumers
Besides the website, our GEC has developed a very active branch of the University of the Third Age (U3A). The U3A provides educational opportunities for retirees in such topics as finance, computers, medicine, and theater. Our co-director serves on the International Board of Directors for the U3A.

KIDS in Health Careers
We have two on-going programs to encourage an interest in geriatrics in high school students. (1) Partnering with a local hospital, we put educational material on their website. This material is designed to encourage high school students to volunteer at nursing homes. (2) We have developed a “Passport to Safety” Program that trains high school students to perform simple screenings on elders at health fairs.

Collaboration
The success of our Gateway GEC has been based on collaboration with multiple partners over the past 12 years. We are particularly excited to collaborate in the areas of TQM and Gaming, but are open to all collaborators. We are happy to provide support and faculty to groups interested in learning more about geriatrics and gerontology.

It’s NEW! GEROPADY ON CD!

GEROPADY, the game that tests your knowledge in geriatrics and gerontology! The game uses the format of the popular television game show, Jeopardy. The GEROPADY kit includes loose-leaf notebook, instructions, questions and answers, five game board transparent overheads, a “Final GEROPADY” overhead, and materials. PLUS new questions are available on a new CD version of the game. $25 for the regular version or $30 for both.

ORDER INFO:
Make checks payable to: SLU-HSC – Geriatrics
Saint Louis University Health Sciences Center Division of Geriatric Medicine
1402 S. Grand Boulevard, Room M238
St. Louis, Missouri 63104

GEROPADY is produced by the Missouri Gateway Geriatric Education Center, the Division of Geriatric Medicine at Saint Louis University, and the Geriatric Research, Education, and Clinical Center (GRECC), St. Louis Veterans Affairs Medical Center.

Book Review by John Morley on

The New Nursing Homes
A 20-Minute Way to Find Great Long-Term Care

By Marilyn Rantz, RN, PhD; Lori Popejoy, RN, GCNS; and Mary Zwygart-Stauffacher, RN, PhD. Fairview Press: Minneapolis, 2001.

The decision to place a loved one in a nursing home is never an easy one. It often occurs at short notice following a hospitalization, and it is always an emotionally charged decision. Most persons have more knowledge concerning how to shop at a supermarket or buy a car than they have about choosing a nursing home.

This gem of a book provides a wonderful guide through the morass of long-term care. It highlights services that can be provided at home and then defines the differences between assisted living, board and care homes, and nursing homes. This chapter is particularly useful for those who are uncertain of what level of care is appropriate for their ailing loved one.

The book points out that a good nursing home is one where the staff stays on top of the fundamentals of care. These include:

■ Help with bathing, eating, and going to the bathroom
■ Keeping residents’ hair, teeth, and clothes clean
■ Offering a variety of good food to eat in a sociable setting
■ Helping people stay involved socially
■ Arranging for medical help when necessary
■ Minimizing the occurrence of injuries and property loss (these happen at one’s own home too, don’t forget).

The second chapter is particularly useful. It tells the struggles of one family in placing their two mothers in nursing homes. This should be required reading for all persons struggling with the decision of whether or not to place their loved one in a nursing home.

The bulk of the book provides useful checklists to help when visiting a nursing home. The authors stress the three golden rules in choosing a nursing home:

■ Cleanliness of residents, staff, and facility with a lack of odors
■ Friendliness of staff (count the smiles)
■ The environment should be homelike.

A chapter is devoted to “Who will pay?” A nursing home can cost between $40,000 and $60,000 a year. This is more than many of us can afford. Alternative financing details are well handled.

A superb chapter near the end of the book points out that finding a high-quality nursing home is just the first step. Relatives remain as responsible as staff for seeing that their loved one gets good care. Get to know the nursing assistants and nurses. Enlist them as your allies. As a physician, I find the failure of many families to be prepared to care for their loved one while visiting obnoxious. To stand by watching while demanding that a nurse’s aide drops everything to clean or feed your loved one is just inappropriate. Nothing should stop family from helping the resident when they visit, and this goes a long way towards ensuring good treatment when you are not there. Also remember that, just as can happen at home, things go wrong in nursing homes. When this happens, avoid anger, but instead, work with the staff to solve the problem.

This small book (170 easy-to-read pages) is a superb primer for anyone with a loved one in a nursing home. It was deservedly chosen for the American Journal of Nursing Book of the Year Awards in 2002.
ulcer, become dehydrated, or die, there should be a substantial cash flow from the institution to the relatives, and of course, the lawyer. This is reminiscent of the mythology of King Arthur’s knights of the round table who nobly raped, pillaged, and plundered to prevent the bad guys from raping, pillaging, and plundering. This self-serving legal mythology needs to be dispelled if there is any hope of improving care for frail elderly in the nursing home.

While mythology often provides an essential crutch to allow us to wend our way through the journey of life, it can often be destructive holding back true scientific progress from improving the quality of life of frail elders. Mythology, like the stories we tell our children about monsters under the bed at night to prevent them from leaving the house and thus allowing the parents to sleep, can be very useful, but can rapidly become a problem when the child develops pathological fears or nightmares or enuresis. Mythology needs to be recognized for what it is—fantasy! Then it can be used to help guide our inner journeys, but at the same time, not become a tool that limits our ability to age successfully or that inhibits scientific progress to find the keys to improving the quality of life of the frail older person.

As we go forward, let us keep close to the hearts the myth of Icarus. Icarus and Daedalus were escaping from Crete. Daedalus fashioned wings of wax for both of them, but warned Icarus not to fly too close to the sun, lest the wings melt. Icarus of course did not listen to the older man, flew close to the sun, and as his wings melted, plummeted to his death in the Mediterranean Sea. As we follow our own myths, let us seek to fly as high as we can without allowing our wings to melt.
Honors....and Mentions

Adult Day Care Group
Honors George Grossberg

George Grossberg, M.D., professor of psychiatry at Saint Louis University School of Medicine, received the Missouri Adult Day Care Association’s Outstanding Physician Award for supporting programs that allow seniors to continue living independently or at home with families.

“Dr. Grossberg has been an important player because he believes in the concept of adult day care and he recommends adult day care programs for many of his patients,” says Sylvia Nissenboim, president of the Missouri Adult Day Care Association.

Dr. Grossberg’s award, as well as 10 others presented at a Sept. 29 ceremony in Jefferson City, marked the 25th anniversary of the opening of the first adult day care center in Missouri.

Since 1976, the number of adult day care centers has grown to 80 in 35 Missouri communities. The centers provide daytime professional care and social and recreational activities for elderly and disabled adults, giving families the support they need to keep loved ones at home.

Saint Louis University Medical Students Have a High Exposure to Geriatrics

Every year, about 10,000 students graduate from American medical schools. In an effort to improve medical education, the American Association of Medical Colleges asks graduates to evaluate their medical school curriculum. In 2001, the questionnaire included questions about geriatrics education. The responses to these questions are summarized below, first for Saint Louis University (SLU) graduates, and then for all medical school graduates. SLU graduates consistently rated their education in geriatrics very positively compared to their peers in other schools. This bodes well for the ever-increasing population of geriatric patients that our graduates will be caring for.

- **Learned about health care needs of healthy elderly**
  - SLU: 90%
  - All schools: 80%

- **Exposed to expert geriatric faculty**
  - SLU: 90%
  - All schools: 80%

- **Small group teaching used for geriatrics**
  - SLU: 70%
  - All schools: 60%

- **Interdisciplinary approaches used for geriatrics**
  - SLU: 70%
  - All schools: 60%

Questions? FAX: (314) 771-8575 • email: agingsuccess@slu.edu

Aging Successfully, Vol. XII, No. 1
Frailty as a Concept

Time (years)

Sarcopenia
Anorexia
Decreased Physical Activity
Arthritis
Pneumonia
Fall
Fear of Decreased Activity

Healthy

Disease

Pathophysiology

Dyspepsia
Cognitive Decline
Demographic
Arthritis
Anorexia
Sarcopenia
Undernutrition
Homocysteine
Testosterone
Cytokines
Theology of Frailty

Fried's Definition

Weight loss
Exhaustion
Weakness (Grip)
Slow walking speed
Low physical activity

Continuum

Functional Impairment
Falls/Fractures
Institutionalization
5. This male hormone plays a role in the pathophysiology of sarcopenia
6. Besides deteriorating mobility, disability, hospitalization, and death, frail persons are more likely to do this
10. In the Fried criteria for frailty, weakness is measured by this (2 wds)
13. This disease causes weight loss and persons with it spend longer in hospital and are more likely to have a second myocardial infarction within a year
14. Persons who fall regularly often develop a ___ of falling leading to restricted mobility
15. In frail elderly, exercise can lead to dehydration. Therefore, before exercising, ingestion of appropriate amounts of these should occur
16. This form of exercise improves tendon flexibility, joint range of motion, and muscular performance
18. This drug decreases cytokines, increases food intake, and decreases testosterone levels
19. Severe excess of these circulating agents leads to cachexia
21. Untreated unstable ___ is an absolute contraindication to an exercise program in frail older persons
22. Excess of this hormone produced by adipose cells aggravates the physiological anorexia of aging
23. Fall-related deaths occur most commonly in this group (2 wds)
24. A persons with arthritic pain limiting mobility should have pain tablets administered not as needed, but rather on a ___ schedule
25. The Fried criteria for frailty include weight loss, exhaustion, weakness, low physical activity, and slow speed doing this

ACROSS

puzzle answer is on page 16

1. Loss of muscle mass in the lower limbs can be secondary to atherosclerosis producing poor ___
2. Severe loss of muscle mass with aging
3. Intensity of exercise in frail older persons is monitored by ratings of perceived ___
4. Decline in the levels of this pituitary hormone with aging is associated with loss of muscle mass
6. This is the leading cause of injury in persons over 65 years of age
7. These are an iatrogenic cause of mobility
8. An organ associated with the regulation of balance
9. To prevent falls, use this type of floor covering
11. This kind of exercise is the best kind to develop muscle strength
12. Activities that impose severe ___ stress should be avoided in older persons
17. The Fried criteria for frailty include a weight loss of ___ or more pounds
20. An ancient Chinese exercise form (2 wds)
Challenges and Choices

The Gateway Geriatric Education Center is pleased to introduce a new game to its readership. “Challenges and Choices” was created by Dr. William Gingold at the GEC Consortium partner, The University of Illinois - Urbana-Champaign. This game presents care providers with an easy-to-use tool for identifying problems, concerns, and conflicts arising in caregiving. The magnetic game board and game pieces allow easy use and repeat evaluations of constantly changing caregiving situations. The game is available at a cost of $30.00

Direct inquiries to Ronna Rhodes at 314-268-5644.

Questions? FAX: (314) 771-8575 • email: agingsuccess@slu.edu
Senior Safety Solitaire - 2nd Edition

The MOGGEC Injury Prevention Project presents this Second Edition of the multi-cultural game, Senior Safety Solitaire, that promotes both home and personal safety. This game comes complete with pictures of safety problems and solution cards and is designed to provide safety information for older adults, volunteers, para-professionals, and professionals, and can be played by a single player or by a group. Price: $65.

To order:
Please send check or money order to:
SLU-HSC
Senior Safety Solitaire
Division of Geriatric Medicine
1402 S. Grand, Room M238
St. Louis, MO 63104
For more information, please call 314-577-8462.
Frailty
(continued from page 5)

to a regrowth of dendrites and synaptic processes in the cerebellum. Simple exercises such as those associated with Tai Chi, the ancient Chinese exercise form, can result in a restoration of balance and a decline in falls.

Depression leads to a reduction in mobility and a pervasive feeling of fatigue. It also leads to a slowing of thought process. Depressed persons are more likely to develop major illnesses, such as myocardial infarction, and to have poorer outcomes following a major event. Depression is a major cause of anorexia and weight loss in older persons.

Cognitive impairment can lead to a decline in processing time and reaction speed resulting in an increase in falls. Physical activity often declines in the cognitively impaired, as does food intake.

Clearly, there are a number of factors that are amenable to intervention, suggesting that frailty is a preventable and reversible condition. As such, frailty becomes an important condition on the road to disability and comorbidity associated with disease. Physicians need to recognize frailty at an early stage and institute appropriate therapies. This will greatly enhance the quality of life of many older persons. In addition, frailty has numerous social consequences. For some frail elders, family and physicians need to modify their expectations of aggressive medical therapies for diseases. Certainly, in frail older persons, a discussion regarding their wishes about an advance directive for health is essential.

While not all frail persons will die within five years, many of those who have a physical illness or an emotional dislocation will. Recognition of which therapies make sense for a frail elderly person and which therapies are heroic and unlikely to improve quality of life or the dying process are essential. Thanks to the work of Linda Fried and her colleagues, frailty is now a more clearly definable syndrome. As such, it is time for clinicians to educate their patients concerning the preventive strategies to slow down the onset of frailty (Table 1). The pathogenesis of frailty remains a complex of intertwined precipitating factors that lead to a vicious cycle of frailty, eventually resulting in functional disability, comorbidity, and death as illustrated in the poster at the center of this issue of Aging Successfully.

### Table 1: Strategies to prevent the onset of frailty in older persons

| F | Food intake maintained |
| R | Resistance exercises |
| A | Atherosclerosis prevention |
| I | Isolation avoidance |
| L | Limit pain |
| T | Tai Chi or other balance exercises |
| Y | Yearly check for testosterone deficiency |

If you are reading someone else’s copy of this newsletter, don’t panic. We won’t call the police, notify the post office, or haul you off to jail. If you wish to receive your own free subscription to Aging Successfully, please fax or mail your name and address to: Ronna Rhodes, Division of Geriatric Medicine, 1402 S. Grand Blvd., Rm. M238, St. Louis, MO 63104 (FAX: 314-771-8575)

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Exercise in the Frail Elderly (continued from page 3)

load greater than what is usual (the overload principle), thus increasing its overall strength and function (ACSM, 2000). Studies indicate that strength gains are more influenced by intensity of resistance training than by age and health status (Mazzeo et al., 1998). Large muscle groups and opposing muscle groups should be targeted to avoid imbalances leading to poor posture and musculoskeletal injuries. Once achieving 10 to 15 repetitions per set for 2 to 3 sets, older adults should increase their intensity by adding more resistance or weight. Resistance training workouts should be limited to 30 minutes. This is more conducive to promoting maintenance (ACSM, 2000). To do this, exercisers can work upper body muscles on one day and lower body muscles the next day. Resistance training should be done a minimum of two, preferably three days per week. In either case, 48 hours of rest should be given to each muscle group before additional resistance training (ACSM, 2000).

When working with frail elderly, choose activities that do not impose excessive orthopedic stress and are well tolerated with their orthopedic limitations. During both stretching and resistance training, discourage exercisers from holding their breath, as this will increase intrathoracic pressures. Finally, stress the importance of strength training as the means of increasing muscle strength and mass, an important step in maintaining function and independence. Aerobic training increases heart rate for an extended period of time and improves the cardiovascular system. For moderate intensity, exercisers should work somewhat hard (RPE of 13; NIA, 1999). A daily accumulation of 30 minutes or more of moderate intensity most days of the week will provide health benefits. To progress, duration should be increased before intensity is increased in order to reduce the risk of injury (ACSM, 2000).

Engaging in aerobic exercise for a minimum of 3 days of the week is recommended. Extremely frail individuals may not be able to engage in aerobic activities. For these people, exercise training should begin with strength and balance training to assure safety before engaging in as little as 5 minutes of aerobic training. Initially, health care providers should train the frail elderly in proper technique, performance, and monitoring. Exercisers should begin slowly and gradually progress to allow proper adaptation to muscles and surrounding joints and connective tissue. Proper instruction in technique and performance will help the elderly avoid injury. Stress the importance of warming up and cooling down by explaining that the body needs a chance to shift from a resting state to a working state and back. An extended cool down should be encouraged to diminish the risk of post-exercise hypotension, syncopal episodes, or arrhythmias during recovery.

Balance exercises can help prevent falls, a major concern in the frail elderly. Most lower body exercises for strength that require standing are also balance exercises. Something as simple as raising one foot off the floor while balancing on the other foot can be done anytime and anywhere there is some type of support to grasp if needed.

(continued on page 19)

Table 1. The Borg RPE Scale

<table>
<thead>
<tr>
<th>Effort</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Least effort</td>
</tr>
<tr>
<td>7</td>
<td>Very, very light</td>
</tr>
<tr>
<td>8</td>
<td>Very light</td>
</tr>
<tr>
<td>9</td>
<td>Fairly light</td>
</tr>
<tr>
<td>10</td>
<td>Endurance training zone</td>
</tr>
<tr>
<td>11</td>
<td>Somewhat hard</td>
</tr>
<tr>
<td>12</td>
<td>Strength training zone</td>
</tr>
<tr>
<td>13</td>
<td>Hard</td>
</tr>
<tr>
<td>14</td>
<td>Very hard</td>
</tr>
<tr>
<td>15</td>
<td>Very, very hard</td>
</tr>
<tr>
<td>16</td>
<td>Maximum effort</td>
</tr>
</tbody>
</table>

(continued from page 19)
Exercise in the Frail Elderly  
(continued from page 18)

Exercise prescriptions for the frail elderly should accommodate their personal orthopedic or cardiovascular limitations. For example, during periods of severe arthritic pain and inflammations, exercise training may be reduced or eliminated until symptoms have subsided. For individuals with severe arthritic limitations, recommend beginning with low-level activities during the first few weeks with mild increases as activity becomes tolerated. Proper footwear is also essential because of potential circulatory limitations, muscle sarcopenia, or degenerative changes in bones or joints.

Because physical frailty results from a combination of aging, chronic disease, sedentariness, and malnutrition (Mazzeo et al., 1998), health care providers should discuss other health issues such as diet, fluid intake, and appropriate attire for the environment. Stress the importance of being alert to and acting upon new or changing symptoms. Specifically outline which symptoms should alert them to contact their health care provider.

Maintenance of an exercise program depends upon removing obstacles that prevent or hinder regular exercise. Encouraging activities that are accessible, enjoyable, convenient, and affordable may remove barriers that prevent incorporation of exercise into the lifestyle. Practical tips such as exercising with others or planning specific days and times to exercise may also increase adherence to an exercise program.

References


MOVING?
Please let us know if this issue is misaddressed or if you will be moving soon. Please fax the label from the back of this issue along with the new address to 314-771-8575. Please allow 8-12 weeks for the change to be effective.
My husband was admitted to the hospital because he vomited up some blood. He was diagnosed as having an infection and given antibiotics. Does this make sense?

It is likely that your husband has a *Helicobacter pylori* infection. These bacteria have been shown to produce ulcers and irritation of the stomach lining. Both of these conditions can result in bleeding. The appropriate treatment is an antibiotic together with a medicine that blocks production of acid in the stomach.

I have mild arthritis that is particularly troublesome in the mornings when I first wake up. Is there anything I can do to wake up without pain and stiffness?

The best way to stop morning symptoms is to take a medicine the night before to prevent the pain from starting during the night. Many of my patients have found that taking two Tylenol ER® (extended relief) tablets before going to bed works extremely well to stop them having pain the next morning. To be effective, this needs to be done every night.

I’m 78 and have been on estrogen for the last five years. I’ve heard estrogen may produce problems with the heart. Should I stop taking the estrogen?

It is most probably safe to continue estrogen at this stage. The HERS study found that there was an increased death rate in the first two years after taking estrogen, but not by five years. The Women’s Health Initiative has found women taking estrogen have an increased death rate from heart disease up to four years after starting estrogen. Estrogen should be taken if you are using it to prevent loss of bone or for menopausal symptoms.
Who Cares About Falls?

Anyone can fall. Accidents happen. However, the fact that one in three adults over the age of 65 falls each year cannot be overlooked. (1)

DID YOU KNOW

- Falls are the leading cause of injury-related deaths in persons over the age of 65. (2)
- In 1998, 9600 people over the age of 65 died as a result of falls (3)
- Yearly costs of acute care for fall-related fractures exceeds $10 billion (4)
- Fall-related deaths are highest among white men, followed by white women, black men, and black women. (2)
- Hip fractures are expected to exceed 500,000 by the year 2040 (5)

Conclusion

Even if you do get back up, falls nearly always have a negative effect on functional ability, sense of independence, mood, and social interaction, not to mention the tolls on your pocketbook!

What Can I Do to Prevent Myself From Falling?

Although it may seem logical to limit one’s physical activity in order to prevent falls, research has shown that physical restraints can actually contribute to fall-related injuries and deaths. Limiting movement and personal autonomy results in muscle atrophy and functional decline. (14)

APPROACH

- Maintain an exercise program that improves strength, balance, and coordination. (21)
- Remove tripping hazards, use non-slip floor mats, and install grab bars next to the toilet and in the tub/shower
- Ask your doctor to review medication in order to reduce their side-effects and interactions. The more medications you take, the greater the risk of falling
- After awakening to go to the bathroom, sit on the side of your bed for a few minutes before standing up or keep a portable toilet close by to minimize falls at night
- Those with low bone mineral densities, indicative of osteoporosis, can be helped by treatment with alendronate or calcitonin. See your doctor. (13)
- High risk fallers can wear protective hip pads to effectively prevent hip fractures. (13)
- Have an eye doctor check your vision each year
- Take Vitamin D and calcium supplements

If you are afraid of falling, please talk to your doctor TODAY.
Who's at Risk?

Everyone over the age of 65 is at a substantially increased risk of falling. And, although all fallers do not fit a certain prototype, certain factors greatly increase one’s chances of falling.

FACTORS

A history of previous falls
Delirium—especially in new onset falls (13)
Urinary incontinence (19)
Postprandial hypotension (drop in systolic blood pressure following meals)
Orthostasis (a drop in blood pressure when standing from a sitting position)
Muscle weakness
Poor gait (walking ability) and one-leg balance (17)
Alcohol use
Restraints (8, 14)
Depression
Poor vision (15)
Psychoactive drugs and polypharmacy, especially antidepressants and anti-anxiety medications (16)
Nocturia
Environmental hazards, such as slippery floors, uneven floors, poor lighting, loose rugs, and unstable furniture (18)
Osteoporosis and poor bone mineral density (20)
Vitamin D deficiency (13, 20)

Measures of Risk

Time how long it takes to stand up from a sitting position. If it takes more than 4.5 seconds, you have an increased risk of falling.

Is it difficult to stand while holding a full glass of water? If so, you have an increased risk of falling.

NOTE: The risk of falling increases significantly with the number of risk factors present, as seen in the graph (18).

By modifying just a few of these risk factors, the risk of falling may be greatly reduced! For example, the time that one can maintain balance on one leg is a major predictor of falls (17). In order to improve one’s balance, perform this simple exercise for 2-5 minutes every day.

1. While standing, place your hands on a counter top or desk to balance yourself.
2. Lift one foot off the ground and balance yourself.
3. Now remove one hand and balance yourself, using your one planted foot and one hand.
4. Hold this position as long as you can WITHOUT FALLING. Repeat, using the opposite leg and hand for balance.

REFERENCES

9. CDC on-line information.

This educational information is brought to you by: Joshua Evans, MS II, Saint Louis University School of Medicine, Funded by the American Federation of Aging Research (AFAR)
Upcoming CME Programs

9th ANNUAL CERTIFICATE PROGRAM IN GERIATRICS
March 15 and 29, April 12 and 26, May 10 and 24 in Mt. Vernon, Illinois.

AN INVITATION TO GROW
University of the Third Age Conference in St. Louis, Missouri (no CME credit)
April 13, 2002

13th ANNUAL SAINT LOUIS UNIVERSITY SUMMER GERIATRIC INSTITUTE
The Faces of Eldercare in St. Louis, Missouri
June 24-26, 2002

ELDER RIGHTS FORUM “MOBILIZING A TEAM”
at Rush-Presbyterian-St. Luke’s Medical Center in Chicago, Illinois
May 17, 2002

All the above conferences will be held at Saint Louis University except as noted.
For more information, please call 314-268-5644 or 314-894-6560.
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