The Arizona Geriatrics Society
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From the Editor

This issue of the Arizona Geriatrics Society Journal is sponsored by the Flinn Foundation, a privately endowed philanthropic grantmaking organization established in 1965 by Dr. Robert S. and Irene P. Flinn to improve the quality of life in Arizona to benefit future generations. The Flinn Foundation Arizona Aging and Cognition Collaborative: Aging, Cognition, and Mobility Conference was held November 2-3, 2013 at the JW Marriott Starr Pass Resort in Tucson, Arizona, and we are delighted to include the White Paper from that state-wide conference in this issue.

The conference focused on the emerging field of precision medicine, also known as personalized medicine. This is the term used for a new model of health care that uses individualized health data to guide decisions to prevent, diagnose, and treat disease for each individual. New mobile and wearable health sensing technologies (termed “mHealth”) has a high potential for transforming health care. Precision medicine applications that bring together aging, cognition and mobility can change the way in which we understand how people move about in their lives, how their activity is changed with treatment, and how these changes in activity can progress or regress over time. What we learn could help to reduce the cost of health care, and to improve well-being. We hope you enjoy learning about the conference outcomes and the exciting possibilities of personalized mHealth!

We also continue to feature our Elder Care Provider Sheets – practical, evidence based short guides for health science students and clinicians, funded by grants from the Arizona Geriatric Education Center and the Donald W. Reynolds Foundation.

Journal contributions on aging related topics are welcome from all of our readers, whether you are a student, researcher or a practicing clinician. Please contact us with any questions.

As always, we hope you find this issue educational and valuable!

Mindy J. Fain, MD

The Arizona Geriatrics Society Journal, an official publication of the Arizona Geriatrics Society, is committed to publishing quality manuscripts representing scholarly inquiry into all areas of geriatrics. It is published twice a year. We encourage submissions of all research, best practice, review of literature, and essays.

Manuscripts should be prepared according to the AMA Manual of Style: A Guide for Authors and Editors, 10th Edition (2007) and emailed as a Word attachment to Mindy Fain, MD, Journal Editor, at mfain@aging.arizona.edu. The first page should include the title and a 50-100 word abstract. Manuscripts are generally limited to 4,000 words and should not be under consideration for publication elsewhere. Manuscripts are reviewed by members of our interprofessional editorial team whose evaluations will provide a basis for the publication decision. We are committed to a rapid review process. Thank you.

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Mindy Fain, MD
University of Arizona Center on Aging
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(520) 626-5800

Thank you!
In November of 2013, the University of Arizona, Arizona State University, Banner Sun Health Research Institute, and industry collaborators held an interdisciplinary Arizona Aging and Cognition Collaborative: Aging, Cognition, and Mobility Conference generously funded by the Flinn Foundation, for the purpose of promoting cross-Arizona collaborations in translational research in mHealth, aging, neurology, and mobility. In this edition, we present the conference findings and propose future alliances across the state of Arizona, providing Arizona’s researchers, industry, and clinicians opportunities to work together in precision medicine mHealth, developing diagnostic, treatment, rehabilitative, and self-care support modalities using our aging, neurology, kinesiology, computer science, bioengineering and other expertise. We invite any who are interested in joining our collaboration to contact us, and look forward to together improving the function, quality of life and health outcomes of Arizona’s older adults.

Jane Mohler, NP-C, MPH, PhD, Bijan Najafi, PhD, David Coon, PhD and Marwan Sabbagh, MD

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Precision Medicine through mHealth Technologies in Aging, Cognition and Mobility

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INTRODUCTION

“Precision medicine,” also known as “personalized medicine” is the term used for a transformative new model of health care that takes individualized health data into account to guide decisions to prevent, diagnose, and treat disease in each individual. Creative use of new mobile and wearable health information and sensing technologies (termed “mHealth”) has high potential for precision medicine applications, to reduce the cost of health care, and to improve well-being. These applications are being developed in a variety of areas, including aging. It is important to support and promote collaborative, translational research in order to benefit from the potential of precision medicine mHealth technologies, to improve health outcomes and to support successful aging.

In November of 2013, the University of Arizona, Arizona State University, and Banner Sun Health Research Institute held an interdisciplinary Flinn Foundation Arizona Aging and Cognition Collaborative: Aging, Cognition, and Mobility Conference for the purpose of promoting statewide Arizona collaborations in mHealth, and bridging translational research in aging, neurology, and mobility. The objective of this White Paper is to report on the findings of that conference, and to propose areas for future collaborations across the state of Arizona with the goals of developing precision medicine mHealth technologies in the areas of aging, cognition, and mobility.

CONFERENCE DESCRIPTION

The Flinn Foundation Arizona Aging and Cognition Collaborative: Aging, Cognition, and Mobility conference was held November 2-3, 2013 at the JW Marriott Starr Pass Resort, in Tucson, Arizona. The objectives of this Delphi-style conference were to:

1) Promote cross-Arizona collaborations in aging, neurology and bioengineering translational research in precision medicine applications.
2) Appreciate major aging-related problems, and the potential for bioengineering applications.
3) Identify and discuss innovations in engineering and their potential application in aging.

4) Identify and discuss important areas of potential collaborative research.
5) Develop a cross-Arizona research agenda in aging, neurology and bioengineering translational research, to be published in the Arizona Geriatrics Society Journal.
6) Develop content-specific working groups to collaborate on future systematic reviews, pilot projects, grant applications, and shared internship and training opportunities.

The multidisciplinary conference committee was comprised of clinicians, bioengineers, and social science researchers. Invitees were selected based upon their clinical and/or research expertise in one of the following areas: geriatrics or gerontology, neurology, physical activity, kinesiology, mHealth technologies, bioengineering, or computer sciences, and included faculty, trainees, and industry partners. A total of 74 persons attended: 21 from Phoenix (Arizona State University and Banner Sun Health), and 52 from Tucson (University of Arizona). Additionally, 4 industry partners presented their technologies, and 20 posters were presented at a conference showcase.

The Delphi process format included three sessions: Aging and Cognition, Frailty Syndrome, and Growing Innovation: “How Tos” and Opportunities. Each session was composed of two mini-lectures—one that was aging-related, and the other bio-engineering related (for example, Aging & Cognition, and Bioengineering Approaches to Aging & Cognition). Small table brainstorming sessions followed the mini-lectures. Each table had eight to ten participants, grouped to maximize cross-collaboration. A trained facilitator moderated and a scribe recorded table-specific discussion. Later, small table findings were shared with the larger group, and ideas ranked in order of importance. Topics are summarized below, with bolded Delphi comments following in each section.

SUMMARY

Older adults are heterogeneous, and range from those who are very healthy to those living with chronic and disabling diseases. Because a disease-free older age is unrealistic for many, it is important to focus on “successful aging” for elders across the health spectrum. Successful aging involves minimizing risk factors for disease; maintaining physical and cognitive functioning; and actively engaging with life (including maintenance of autonomy and social support). There is a need to develop mHealth modalities for use within the health care system (requiring FDA approval), and as consumer targeted products (outside of FDA purview).

Population Aging

People continue to live longer and the US population is increasingly older. Nearly 40 million people in the US are age 65 or older, and life expectancy at birth now exceeds 78 years. Most notable is the growth in the population of individuals age 85 and older who are at highest risk for disease and disability. **There is an urgent need for mHealth applications to support independent living. This includes helping those who are vital and independent to remain so, and by providing diagnostic, treatment, and rehabilitative**
support for dependent older adults, supporting their living in the home and community, outside of institutions.

Aging-Related Health Care Costs
In 2010 the US spent $2.6 trillion (17.9%) of the gross domestic product on healthcare, much of which was spent on aging adults. Although elders account for just 13% of the population, they used 21% of total national health care dollars in 2012, 28% of the costs of hospital care, and 24% of the costs of healthcare provider services. Medicare spending is projected to nearly double by 2023 to $1.1 trillion due to population aging, and increased health care costs. Medical costs for adults aged 65 and older average nearly $10,000 each, significantly more than the average 2009 per capita cost of $7,598. We must assure high quality care, while decreasing health care costs. mHealth technologies will likely be a key part of the solution.

Increasing Dependency Ratio
The ratio of the number of people who need help per working person (i.e., the number of people older than 65, and under 20, compared to those of working age, 20 to 65) is the dependency ratio. Advances in health care and changes in lifestyle have extended the life expectancies of the older generation. As families have fewer children, and as women (traditional elder caregivers) work in the workforce, there are fewer caregivers available to care for, and support aging dependents. mHealth technologies are poised to help support elders living independently in the home and community, communicating and supporting their care.

Physical Functioning
An older adult’s ability to function independently is one of the most important quality of life issues. However, function often diminishes with increasing age. Aging is accompanied by declines in visual and auditory acuity, a slowing of reaction and response times, declines in motor skills and agility, and changes in cognitive processes such as lapses in memory and attention. New interventions can improve how older people function, by helping to prevent falls, improve muscle function (size, strength and power), and reduce delirium. We need strategies to help healthy older people remain productive and independent, and to ensure that those who are frail or disabled receive care and support so that they can live in their communities for as long as possible. Researchers have identified several markers, including grip strength, gait (walking) speed, frailty and balance parameters that can be used to predict the onset of limitations in mobility, fall risk and frailty syndrome.

Falls
Falls and fall-related injuries impose an enormous burden on individuals, society, and the nation’s health care systems. Falls are a common and complex geriatric syndrome that cause considerable mortality, morbidity, reduced functioning, and premature nursing home admissions. Falls have multiple precipitating causes and predisposing risk factors which make their diagnosis, treatment, and prevention a difficult clinical challenge. A fall may be the first indicator of an acute problem (infection, postural hypotension, cardiac arrhythmia), may stem from a chronic disease (parkinsonism, dementia, or diabetic neuropathy), or simply may be a marker for the progression of “normal” age-related changes in vision, gait, and strength. Many falls, and fall-related injuries, could be prevented with existing knowledge and technology, such as that developed and employed for fall detection in medical alert fall pendants.

Frailty
Frailty is a hyper-inflammatory state of vulnerability, which reflects multisystem physiological change. Current thinking is that not only physical but also psychological, cognitive and social factors contribute to this syndrome and need to be taken into account in its definition and treatment. Together, these signs and symptoms reflect a reduced functional reserve and consequent decrease in adaptation (resilience) to stressors, resulting in higher risk for accelerated physical and cognitive decline, disability, institutionalization, and death. Remote monitoring of balance, proprioception, gait and patterns in natural physical activity can detect increasing risk of frailty, and can aid in targeted rehabilitation by using virtual reality based training in the home and community.

Cognitive Decline
Mild cognitive impairment (MCI) is an intermediate state between normal cognitive aging and dementia, although some people with MCI never develop dementia. More than 35 million people worldwide have dementia, characterized by irreversible decline in memory, problem solving, communication, and other cognitive functions. Alzheimer’s disease incidence doubles every 5 years after age 65. By 2050, it is estimated that more than 115 million people will have dementia worldwide. Risk factors for dementia include physical inactivity, infrequent participation in mentally or socially stimulating activities, and vascular risk factors including high blood pressure, diabetes, and smoking. There is often a delay in the diagnosis of dementia, and there is no cure for dementia, although drugs can be used to manage some of the symptoms.

Strategies are needed to reduce cognitive decline, including programs which combine physical activity and cognitive performance. Sensitive measures of physical activity and cognition are needed to personally target interventions, and to measure change over time. mHealth technologies are needed to support caregivers, allowing those affected to live longer at home, with higher quality of life and lower costs.

Medical Advances
Medical advances have prolonged the lives of older adults; however, longevity may come at a steep price. Many elders face poor functioning and quality of life, cognitive decline, falling, chronic pain, isolation, depression, hospitalization, or institutionalization. In addition, they are challenged with performing self-care for complex medical and medication regimens with little assistance, while suffering from sensory losses, multimorbidity related disability, and sometimes cognitive decline. Safety monitoring, chronic disease, medication management, and improving access to personal health information all provide significant opportunities for the application of mHealth technologies for older adults. Technologies can provide medication adherence through reminders, alerts and feedback to missed medications; alert formal and informal caregivers and prompt interventions to significant changes in status, incident falls or injuries; provide access to personal health information; and support caregivers in chronic disease management and post-discharge self-care interventions.

Building and Sustaining Resilience and Healthspan
Healthy older adults are looking to health promotion activities that build and sustain health, including improving their nutrition, supporting and logging exercise regimens, and decreasing stress through biofeedback. They are doing this not only to increase their longevity, but also to increase their Healthspan—the number of healthy
and active years of life. mHealth technologies responsive to these needs are often pursued by self-paying individuals. They are rarely FDA-approved, but offered in the consumer market, and paid out-of-pocket, rather than as health commodities. Older adult targeted health promotion support devices could help elders increase their healthspan, and support activities to decrease health risk including physical activity, good nutrition, stress reduction and social interaction support.

Cost Savings
The potential of mHealth for cost savings is substantial. A 2010 Juniper Research report on mHealth projected that by the year 2014 public and private healthcare providers could save between $1.96 billion and $5.83 billion in healthcare costs by using mHealth technologies for health monitoring worldwide. If we are to use these technologies cost-effectively, we have to do so by incorporating the Institute of Healthcare Improvement’s “triple aim” high value framework in all we do—focusing on 1) Improving the health of populations; 2) Improving healthcare for individuals; and 3) Reducing the per capita cost of health care.

Older Adult Technology Diffusion
We are witnessing unprecedented development and diffusion of technology into everyday life, including computers, communications, safety, and health monitoring devices. Technology has great potential for improving the quality of life for older adults. Technology can also enable elders to remain connected to family and friends, and is increasingly used for the delivery of healthcare services, in-home monitoring, interactive communication, transfer of health information, and self-care support. The aging population presents vast societal challenges to ensure that our infrastructures can support the needs of older people enabling them to live healthy, independent, and productive lives. To meet these challenges, we must rethink and redefine what it means to be “older.” Today’s older adults are very different from previous cohorts of older adults, and baby boomers, are likewise different. Age-related changes in function have vast implications for the design of products, environments, and activities – and varying by age cohort.

Older Adult Form Factor
The overall objective of human factors engineers is to improve the “fit” between people and the designed environment to maximize performance, safety, comfort, and user satisfaction, and minimize the likelihood of errors, inefficiencies, injuries, fatigue, and user dissatisfaction. To achieve this objective, human factors engineers propose a user-centered, systems approach to design in which age-related changes in capabilities, tendencies, and preferences are incorporated into guidelines for design of products, tasks, and environments. The application of human-factors and ergonomics principles can improve the health, safety, and quality of life of older people. Elders often encounter difficulties because they receive inappropriate training or because designers of the technology have not taken into consideration the needs of older people. User testing and user-centered design are critical to the success of technical systems.

Human factors engineering, the study of human beings and their interactions with products, equipment, and environments in the performance of tasks and activities, could have great benefits for improving the independence and quality of life of older people. We currently know very little about the efficacy of design aids and support tools for older adults. We also need more information on the best way to train older adults to use new technologies, and there are many unanswered questions about the best designs of online training programs and multimedia formats. Furthermore, issues of privacy and trust in technology are critical areas for research.

CONCLUSION
As we grapple with the concomitant challenges of population aging, unsustainable health care costs, increasing dependency ratios, and growing mHealth technologies, we need to do so mindfully. mHealth technologies have the potential to support resilience in aging, delivering better population health outcomes, and higher quality care, at a lower cost. For older adults and their caregivers, mHealth offers the potential for low cost self-care, supporting optimal functioning, and allowing aging adults to remain independent in the home and community. For healthcare providers, systems and payors, precision medicine mHealth has the potential to support the resilience, cognition, and mobility of our aging population.

This conference promoted cross-Arizona collaborations in aging, neurology and bioengineering precision medicine applications in translational research. It was instrumental in creating an appreciation of major aging-related problems, and building knowledge of potential bioengineering applications in aging. Important areas of potential collaborative research were discussed, and the first steps in developing a statewide research agenda in aging, neurology and bioengineering translational research were made. Specific plans included shared internship and training opportunities, shared pilot projects, shared systematic reviews, publications and grant applications, and future conferences.

The Building Resilience through mHealth Technologies in Aging, Cognition, and Mobility conference identified several common areas of interest for fostering strong statewide collaboration. It provided Arizona’s researchers, industry, and other partners clear opportunities to work together in defining and advancing the role of precision medicine mHealth. The conference was instrumental in achieving the framework to develop high value diagnostic, treatment, rehabilitative, and self-care support modalities to improve the health outcomes of Arizona’s seniors.

CITATIONS
Constipation in the Elderly
Darlene Moyer, MD and Amy Tierney, MD

Abstract:
Constipation is a common and persistent problem among elderly patients. Although it is a common disorder in this age group, constipation should never be considered a normal part of aging. Providers should actively evaluate and manage constipation with the goal of improving quality of life for their patients. This review provides information to help guide providers through the diagnosis, evaluation, and treatment of constipation specific to the elderly population.

Introduction:
Constipation is a pervasive problem in the elderly, as any geriatric provider knows well. Although it is a common disorder among older patients, constipation should never be considered a normal part of aging. By evaluating co-morbid medical conditions, medications, and other potential contributing factors, providers can often find and eliminate the cause. Constipation in the elderly can often be relieved by simple non-pharmacologic interventions. When pharmacologic treatment is indicated, it should be implemented with the patient’s comorbidities and goals of treatment in mind.

Scope of the problem:
The prevalence of constipation in all adults is estimated to be between 2 - 27%. An estimated 50-74% of nursing home residents use daily laxatives and 50-80% of hospitalized elderly patients suffer from constipation.1,2 However, this is not just a problem for institutionalized patients. Among community dwelling adults over the age of 65, 30-40% also suffer from chronic constipation.3-6 In addition, 25% of females and 20% of males over the age of 80 who are community dwelling use a laxative at least monthly.2 Prevalence is difficult to assess because of the various definitions used to diagnose constipation.5

Certain groups have a higher risk of developing chronic constipation with age. Elderly women have 2-3 times higher rates of constipation than elderly men.5 Non-white race, decreased physical activity, low income and educational level, high risk medications, living in a rural area, low fiber intake and depression are also risk factors for developing chronic constipation.5,6

As one of the most common gastrointestinal related complaints at primary care visits and reasons for gastroenterology referrals, constipation is a significant burden to our health system.4 An estimated 2.5 million physician visits related to constipation occur in the United States each year along with 92,000 hospitalizations.2,6 In addition, laxatives are some of the most frequently prescribed medications.4 The estimated annual cost for each nursing home patient with constipation is $2,253.2,7 Constipation has been linked to anxiety, depression, social dysfunction and decreased quality of life. In patients with dementia, constipation has been linked to aggressive behavior.8,9

Pathophysiology:
There is often confusion between patients and providers about what constitutes constipation. Patients will describe stool consistency, straining, and incomplete or inadequate defecation in their definition. Providers tend to utilize frequency and duration of symptoms when describing constipation.5 By convention, mild constipation would classify as one or more bowel movements in a week; whereas severe constipation would indicate less than one bowel movement per week. Furthermore, an acute episode would last less than three months; chronic constipation would suggest symptoms lasting longer than three months.5

An international panel of gastroenterologists, looking for a more definitive diagnosis, first met in Rome, Italy in 1989 to discuss the diagnosis criteria for functional constipation. They created the Rome Criteria (table 1), now in its 3rd incarnation, which was published in 2006 and provides a structure for diagnosing constipation.10

Table 1. Rome III Criteria for diagnosing Functional Constipation

<table>
<thead>
<tr>
<th>Must include 2 or more of the following:</th>
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<tbody>
<tr>
<td>• Straining during at least 25% of defecations</td>
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<tr>
<td>• Lumpy or hard stools in at least 25% of defecations</td>
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<tr>
<td>• Sensation of incomplete evacuation for at least 25% of defecations</td>
</tr>
<tr>
<td>• Sensation of anorectal obstruction/blockage for at least 25% of defecations</td>
</tr>
<tr>
<td>• Manual maneuvers to facilitate at least 25% of defecations (e.g., digital evacuation, support of the pelvic floor)</td>
</tr>
<tr>
<td>• Fewer than three defecations per week</td>
</tr>
</tbody>
</table>

The physiology of defecation is a series of complicated, neurological processes, coordinated between the pelvic floor and anal sphincter. Voluntary defecation is mediated via the cerebral cortex, which allows for both the conscious perception of the need to evacuate and the activation of local reflexes to do so. First, the patient will adopt a position that straightens the anorectal angle. Then, the external anal sphincter and puborectalis muscles relax. The contents of the rectum will initiate the rectoanal inhibitory reflex, relaxing the internal anal sphincter (IAS). Abdominal wall muscles tense, increasing abdominal pressure, moving stool through the relaxed anal canal. Rectal contractions, via the spinal cord reflex, continue until the rectum fully empties.

Certainly, anatomic changes in the aging body can impair the normal functioning of this complex physiologic cascade. A 37% loss of enteric...
neurons was found in the colons of people greater than 65 years of age, when compared with their younger counterparts. Also, older people have reductions in their rectal sensitivity and anal function, as well as decreases in IAS pressure and pelvic muscle strength. Aging women in particular have reduced squeeze pressures; however, parity does not seem to be the reason. Interestingly though, significant functional changes to the aging GI tract has not been identified. Colonic motility and gut transit time are mostly unchanged in active, healthy older adults. The same cannot be claimed for nursing home residents, who show a prolonged gut transit time of anywhere from 4 to 9 days (normal is less than 3 days). It appears that bowel function is influenced more by secondary factors related to aging, such as inactivity, disease and medications, than by the aging process itself.

Causes of Constipation

Primary Constipation can be sorted into 3 categories. The most common is Normal Transit Constipation, also known as Functional Constipation. As the name implies, stool passes through the colon at a normal rate. Symptoms present infrequently, and patients do not have pain or strain with attempts to defecate. Slow Transit Constipation involves the prolonged passage of stool through the colon. Patients will complain of bloating, infrequent and difficult stooling. Outlet Constipation is an anorectal dysfunction, promoted by the inefficient coordination of pelvic musculature in the attempt to evacuate.

Table 2. Causes of Secondary Constipation

<table>
<thead>
<tr>
<th>Endocrine/Metabolic</th>
<th>Structural Abnormalities</th>
<th>Medications</th>
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<tbody>
<tr>
<td>Diabetes Mellitus</td>
<td>Anal fissures, strictures, hemorrhoids, colonic strictures</td>
<td>Analgesics (opioids, NSAIDs)</td>
</tr>
<tr>
<td>Hypercalcemia</td>
<td>Inflammatory bowel disease</td>
<td>Antacids (containing Al or Ca)</td>
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<tr>
<td>Hyperparathyroidism</td>
<td>Obstructive colonic mass lesions</td>
<td>Anticholinergics (TCAs, anti-histamines, antipsychotics, antispasmodics)</td>
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<tr>
<td>Hypothyroidism</td>
<td>Rectal prolapse or rectocele</td>
<td>Antidepressants (TCAs, MOAs)</td>
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<td>Uremia</td>
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<td>Calcium channel blockers</td>
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<td>Myopathic Conditions</td>
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<td>Diuretics (furosemide, HCTZ)</td>
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<td>Amyloidosis</td>
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<td>Iron</td>
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<td>Myotonic dystrophy</td>
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<td>Other</td>
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<td>Scleroderma</td>
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<td>Irritable Bowel Syndrome</td>
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<td>Neurologic Diseases</td>
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<td>Multiple Sclerosis</td>
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<td>Somatization</td>
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Secondary Constipation encompasses all other causes of constipation. Many factors contribute to symptomatic constipation, which seem to disproportionately affect the older adult. Broadly, they can be categorized into medical and psychiatric disorders, structural abnormalities and medications. Common examples have been listed in Table 2.

Clinical Evaluation

History:

An initial history should aim to determine whether the patient meets criteria for constipation and identify any contributing factors or concerning symptoms. Patients should routinely be asked about the frequency of bowel movements, perceptions about normal bowel movements, onset and duration of symptoms, stool characteristics, bleeding, straining or pain with defecation, weight loss, abdominal pain or bloating, fecal soiling or diarrhea and the need to assist with stool evacuation. Consider asking patients to keep a stool diary if they are unable to provide this information as there is significant variation in what patients perceive as normal bowel movements. Patients with constipation should be asked about red flag symptoms including rectal bleeding, acute onset, weight loss and previous personal or family history of colon cancer. Additional historical elements such as pelvic floor trauma, childbirth, pelvic or rectal surgery, and previous anal pathology can sometimes reveal a cause. A thorough medication review and review of co-morbid medical conditions should be completed to identify any potential contributing factors. A dietary history including fiber intake is also important.

Physical Exam:

A complete physical exam should be performed to look for causes and/or complications of constipation. Poor dentition or other oral lesions might indicate poor dietary intake. A detailed abdominal exam should be performed to identify distention, pain, masses, bowel obstructions, and hernias. A rectal exam should always be performed on elderly patients with constipation. Specifically, providers should look for anal fissures, hemorrhoids, excoriations, fistulas, and prolapse, and examine the perineum at rest and with bearing down. Normal descent is between 1 and 2.5 cm. Minimal descent can indicate poor pelvic floor muscle relaxation while excessive descent can lead to outlet obstruction as a cause of constipation. Internally, the anus should also be examined for tone, strictures, pain, and spasm.

Testing:

Evidence for what testing should be done in elderly patients with constipation is lacking. Elderly patients experiencing constipation should probably undergo basic laboratory investigations including blood counts, thyroid testing, and basic metabolic testing. This simple set of labs can reveal associated anemia, hypothyroidism as a cause or contributor, and electrolyte abnormalities that might contribute to constipation. The decision to pursue imaging studies and endoscopy should be determined based on the presence of alarm symptoms suggestive of obstruction, cancer, and other organic disease, or with acute onset of constipation in the elderly. Further specialized testing of colon transit and pelvic floor function such as
anorectal manometry should only be performed in patients with severe constipation who do not have a secondary cause, have failed treatment interventions, and when surgery is being considered.5,14

Treatment:

If the patient’s constipation can be attributed to a medical condition or medication, stopping the causative agent, substituting it with an alternative agent, and treating the underlying medical condition can often relieve the constipation.1 Inevitably, despite causing constipation, some medications will be necessary due to the nature of the underlying illness. These patients might need to be treated prophylactically for constipation as a side effect.11 For example, virtually all elderly patients on chronic narcotics for pain will need to be on prophylactic bowel care.

Non-Pharmacologic Treatments:

Patients who do not respond to the urge to defecate are more likely to have less frequent bowel movements and a higher incidence of constipation. If possible, patients with constipation should be educated to respond when they feel the urge to defecate, rather than ignoring it.15 Patients should also be advised that because of the gastrocolic reflex, their bowels are most active first thing in the morning and 30 minutes after meals. Creating routines that take advantage of these times is an appropriate step in managing constipation.11

Dietary fiber is directly linked to increased volume of stools and decreased colonic transit time. Bulkier stools create colonic distention and result in better stool propulsion.3 The recommended amount of daily fiber intake for adults is 25-35 grams. However, most Americans consume between 5 and 10 grams daily. Food diaries can reveal low fiber intake and patients can be educated to increase fiber intake slowly (5g/d/week) until they are at the goal amount. Increasing fiber intake too quickly can lead to bloating and flatulence, which generally improves quickly with ongoing intake.3,4,11

Contrary to popular belief, low fluid intake has not been shown to be a contributing factor for constipation in the elderly.3 Therefore, providers should refrain from encouraging increased oral intake of fluids in this population who tends to be at risk for fluid overload due to conditions such as chronic kidney disease and heart failure.3,11

Immobility has been shown to be a risk factor for constipation and physically active adults have a lower risk of constipation.16 However, increasing physical activity has not been shown to relieve pre-existing constipation.17 Although regular exercise should be recommended for its overall health benefits and its role in preventing constipation in elderly patients, there is no evidence supporting its role in treating constipation.3,11

Other considerations, especially in elderly patients in facilities, include time and privacy. Providers and staff should ensure that patients get adequate time to have a bowel movement, as well as enough privacy for them to feel comfortable relieving themselves.

Pharmacologic Treatments:

Currently there is no universal treatment plan that can be applied to all elderly patients. Even in agents that have been studied, evidence specific to treatment in the elderly is lacking.

Laxatives:

Bulk laxatives are hydrophilic and work by absorbing water, increasing stool mass and result in a softer stool consistency. They come in both soluble (psyllium pectin or guar) forms and insoluble forms (cellulose). Bulk laxatives usually take a few days to work. If patients are able to ingest the goal amount of dietary fiber they shouldn’t need bulk laxatives.3 Patients with normal transit constipation usually benefit from bulk laxatives and experience less symptoms of abdominal pain and hard stools. Some patients will experience bloating and flatulence with this class of medications.11 It is important to know that these agents can affect the absorption of warfarin, digoxin, aspirin, iron and calcium, all common drugs in the elderly population.3

Stool softeners, which are also known as emollient laxatives function by decreasing surface tension and allowing water to enter the bowel more easily. The most common stool softeners are docusate sodium and docusate calcium. There is not much evidence supporting their use in chronic constipation and they might be more useful in the setting of anal fissures and hemorrhoids.3 They are not usually as effective as bulk laxatives, but are generally well tolerated.11 However, these agents have been shown to cause fecal soilage in the elderly, so they are no longer recommended in this age group.4

Osmotic laxatives function by drawing water into the intestines resulting in softer stool and better peristalsis.3 No single osmotic agent is more beneficial than another, therefore the choice of agent needs to be made with an individual’s co-morbidities in mind.5 Of the agents in this category, providers should be aware that saline laxatives (magnesium hydroxide, magnesium citrate, and sodium bisphosphate) can cause electrolyte disturbances including hypokalemia and hypermagnesemia, especially in patients with renal failure.4 Polyethylene glycol, a macrogol, has very good evidence for treating chronic constipation; however, it was not specifically studied in the elderly.3 The poorly absorbed sugar lactulose is another agent in this category. In nursing home patients with a mean age of 84, lactulose increased stool frequency and decreased bowel impactions compared to placebo.18 It is important to know that all of these agents can cause bloating and flatulence.11 Polyethylene glycol is not metabolized by colonic bacteria, and therefore causes fewer of these symptoms than other agents. However, its use has been linked to fulminant pulmonary edema, most likely prompted by patient aspiration. Therefore, this agent should be used cautiously in patients who are at high risk for such events.4

Like osmotic laxatives, stimulant laxatives draw water into the intestines, but they also increase intestinal motility by stimulating the myenteric nerve plexus. As a result, they tend to work much faster (6-12 hours); but can also result in abdominal cramping due to increased peristalsis.3,11 The most common of these agents are senna and bisacodyl which are approved only for intermittent treatment of constipation, and not for chronic constipation.5 Besides abdominal cramping, stimulant laxatives can also cause electrolyte imbalances, allergic reactions, and hepatotoxicity. Long term use of stimulant laxatives is associated with melanosis coli and colonic inertia.4,11 One study did show that the combination of senna with a bulking agent was more effective in treating nursing home patients with chronic constipation than lactulose alone.19 Stimulant laxatives should never be used in patients with a known or suspected bowel obstruction.6 See Table 3 for a summary of laxative use in the elderly.
other options

A newer option is the chloride channel activator lubiprostone. This medication works by increasing fluid secretion into the colon, causing improved stool passage. It is approved for treatment of chronic constipation. Data regarding its effectiveness specific to the elderly population is limited. The most common side effects include nausea and headache.

Enemas and suppositories are also available to treat constipation. There is not much evidence available to support their use in chronic constipation. They can be used intermittently to relieve acute constipation and achieve rectal evacuation. Sodium phosphate enemas should be used cautiously in the elderly as they can cause electrolyte abnormalities.

Probiotics show promise in the treatment of chronic constipation. In a recent randomized trial which included elderly hospitalized patients in an orthopedic rehabilitation program, probiotics where shown to decrease the need for laxative use. More studies are needed before clear recommendations can be made about their use.

Biofeedback is a treatment option for patients found to have anorectal dysfunction as a cause for their constipation. During biofeedback, patients are retrained to have normal coordination of their anal sphincter and pelvic floor muscles through the use of simulated bowel movements with artificial stool. This modality is very effective in improving constipation related to pelvic floor dysfunction, but has not been studied in the elderly population. Certainly, it would not be an appropriate option in patients with significant dementia.

Surgery for constipation is a last resort, and only indicated when it has been determined that slow colonic transport is the cause of the constipation. Surgery can also be considered for patients who have large rectoceles that interfere with bowel movements. Colectomies should not be performed on patients when the source of their constipation is anorectal dysfunction.

Conclusion:

Constipation is a common problem that adversely affects elderly patients. Providers should be vigilant when it comes to evaluating and treating this disorder. It should never be considered a normal part of aging. Although more research is needed in regards to the treatment of constipation in elderly patients, there is some evidence to help guide our interventions. We should always keep co-morbidities in mind, thus avoiding potential complications. Thoughtful application of both pharmacological and non-pharmacological therapies can relieve constipation symptoms, and improve the elderly patient’s quality of life.

References:
Setting Goals for Care of the Person with Behavioral Variant of Frontotemporal Degeneration (bvFTD)

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Jill Shapira, PhD, ANP-BC, Sharon Denny, MA

Abstract

Caring for people with non-Alzheimer dementias is particularly challenging for families and care providers. This is especially true for those with frontotemporal degeneration (FTD), who present with profound changes in personality, behavior, movement, and language impairment. Initial symptoms are often misdiagnosed as psychiatric disorders or early onset Alzheimer’s disease (AD), and typically do not respond to pharmacologic and non-pharmacologic interventions approved for people with other dementias. Using individual examples, this article will illustrate common features of the most common of the 3 subtypes: behavioral variant FTD (bvFTD).

Introduction

Frontotemporal degeneration (FTD) represents a leading cause of early-onset dementia among individuals less than 65 years, although onset of symptoms can occur as early as age 21 and as late as age 80. It is estimated that FTD currently affects approximately 50,000-60,000 Americans.1 There is an anticipated life expectancy of 7-13 years from disease onset.2 At this writing, there are no therapeutic interventions developed and tested for people with FTD.

The hallmark features of FTD include gradual, progressive decline in personality, behavior, and/or language, with associated changes in motor function among some people3. Common declines in personality include the following losses: insight, ability to update personal image, ability to determine right from wrong, empathy, ability to inhibit, and the development of extreme self-centeredness. FTD results from progressive damage to the anterior temporal and/or frontal lobes of the brain due to a spectrum of pathological and genetic disorders. Symptom presentations vary based on the area of the brain affected although the three subtypes of FTD share many clinical characteristics, especially in moderate to advanced disease. Functional losses are the result of impaired executive function, and may include disinhibited and impulsive behavior, apathy, diminished empathy and a lack of concern about the disease.4,5,6 Some individuals have significant language impairment. Subsets of individuals develop movement disorders with Parkinsonism such as progressive supranuclear palsy (PSP); amyotrophic lateral sclerosis (ALS), or corticobasal degeneration (CBD).

Types of FTD

FTD is divided into three types, depending on the earliest presentation of symptoms:

1. Progressive behavioral and personality decline – marked by changes in behavior, emotions, concentration, attention, judgment, apathy, ability to reason, ability to inhibit and capacity for empathy

2. Progressive language decline – characterized by early changes in ability to speak, understand spoken and written language, and write

3. Progressive motor decline – marked by difficulty with movement including motor planning (apraxia), development of tremor, weakness, poor coordination, falls, gait changes, and poor coordination

Detecting FTD

Most people with FTD perform well on standard cognitive screens, and do not suffer from memory loss or visuospatial impairment until the more advanced stage of the disease. However, because they score well on most cognitive tests, often present at a younger age, and typically have a lack of insight, people with FTD are often misdiagnosed as having psychiatric illness, personality disorders, eccentricity, or mild cognitive impairment (MCI).7 Delays in accurate diagnosis and increasingly impaired judgment contribute to significant problems with issues of capacity, consent and implementation of advance directives.

People with FTD are often young, more physically active, and may exhibit more disruptive, angry, and compulsive behaviors than people suffering from Alzheimer’s disease (AD). As a general rule, people with FTD do not respond to well-established, evidence-based interventions for Alzheimer’s type dementias8 including cholinesterase inhibitors such as donepezil9 or memantine10. In addition, behavioral management strategies used for AD such as distraction have limited efficacy for the FTD. The purpose of this manuscript is to use a case study to introduce concepts of care in the most common form of FTD: behavioral variant FTD (bvFTD).

Case Study: Behavioral Variant FTD (bvFTD)

The salient features of bvFTD include profound alterations in personality and behavior causing disruption in social relationships. Intact frontal lobes facilitate our executive abilities to design, organize and carry out activities and also help modify emotions and behaviors to fit socially appropriate norms. People with bvFTD exhibit disorganized, apathetic and disinhibited behaviors, and often develop compulsive thoughts, obsessive and rigid behaviors due to damage to the non-dominant frontal and prefrontal cortex.

Mild disease

Joan was a corporate banking executive and mother of two teenagers, who began to have difficulty in her work at age 48. She made mistakes completing forms, missed appointments with clients, became aggressive at staff meetings and was accused of sexual harassment after grabbing and kissing a colleague. She denied...
having any problems and was being counselled at work prior to losing her job.

She divorced her husband, Dave, of 20 years with little notice and moved to an upscale residential hotel without saying farewell to her children. The children were to split their time between Joan and Dave; however Joan asked that they live with Dave in order for her to pursue her new “singles” life. Joan lost her job, spent her time shopping and going to the casino. Within one year she had spent her divorce settlement and was threatened with becoming homeless. Joan’s parents took her into their home after they visited her and discovered several disturbing things: her diet consisted solely of potato chips, ice cream and candy bars; she had subscriptions to 24 magazines arranged in disorganized piles; she had been hoarding clothing from the Women’s Resource Center; and she had obtained a dog that was underfed and dehydrated from lack of water. After two months of trying to integrate Joan into their home, her parents insisted on a neurological evaluation.

Joan was diagnosed with bvFTD, and a family meeting with the neurologist and nurse practitioner was scheduled. Joan insisted there was nothing wrong with her but agreed to live with her parents. Joan’s parents attended dementia support groups, however they recognized that most participants had different issues, as their family members had Alzheimer’s-type dementia. Joan’s brothers and sisters visited, trying to understand why their parents were so stressed. Joan appeared to be normal to them, generating family conflict about whether Joan was exploiting her parents.

Joan agreed to wear a Safe Return Identification bracelet and had a GPS device placed in her shoe after refusing to give up driving. The treatment team assisted Joan’s family in obtaining retroactive disability benefits since her inappropriate behavior was due to a neurological disease. Her living situation improved with the structure and supervision provided by her parents. Joan had no independent interests or hobbies other than six to eight hour daily walks with her dog, regardless of weather conditions. These walks followed a consistent pattern although Joan frequently returned home with scrapes and insect bites.

<table>
<thead>
<tr>
<th>Characteristics of Mild bvFTD Demonstrated by Joan</th>
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<tbody>
<tr>
<td>Executive impairment: trouble organizing and completing tasks</td>
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<tr>
<td>Social Disinhibition: sexual advances to a colleague</td>
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<tr>
<td>Compulsive behavior: ordered 24 different magazine subscriptions</td>
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<tr>
<td>Lack of empathy: divorced husband; left children without farewell; unaware of dog’s thirst</td>
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<tr>
<td>Lack of insight: unaware of her disability</td>
</tr>
<tr>
<td>Compulsive spending: unaware of her disability</td>
</tr>
<tr>
<td>Intact visuospatial abilities: took walks (roaming) without getting lost</td>
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**Care Goals in the Early Stage**

In early disease, care is focused on identifying and diagnosing the problem. As FTD is often not recognized, an evaluation by a behavioral neurologist is important. A second goal in early disease is the protection of family resources. Because of the lack of insight and compulsive behaviors, it is not uncommon for people with bvFTD to spend or gamble away their life’s savings. In addition, the person with FTD may be fired for poor job performance or inappropriate social interactions with co-workers. It is imperative that the family consult with an elder law attorney to prepare advanced directives and assist with attaining disability insurance. Employers must be notified in order to have the person placed on disability insurance, rather than be fired or demoted, in order to obtain the appropriate insurance coverage. Families are commonly forced to limit the person’s access to money, credit, and the Internet.

A third goal is disclosing the person’s illness to essential people – most notably immediate family members, children, and employers. Placing the person’s behavior in the context of an illness can help with decreasing family anger and conflict. If there are school-aged children in the household, special attention should be given to notifying the guidance counsellor and carefully monitoring grades to recognize the emotional impact and areas that could benefit from support care.

Persons with FTD often follow rigid behavioral patterns. The final goal is to help the individual develop an acceptable routine by suggesting safe activities that can be followed automatically day after day. The routine may tap into the person’s previous likes and compulsions. Unlike AD where distraction is encouraged, in FTD the goal is to build the acceptable compulsive behavior into the habits. This will help to decrease anxiety and acting out.

**Moderate disease**

Over the next 18 months Joan’s disease progressed and she initiated very little productive behavior. She needed to be led into the shower and would perform oral care only when a toothbrush with paste was placed in her hand. Joan did not comb her hair, apply makeup, or change her clothes without considerable direction. She did not spontaneously help with chores, but would clear the table and wash the dishes when asked. Joan was occasionally incontinent of urine and bowel, particularly when in public. After urinary tract infection and constipation were ruled out, Joan’s parents decided to use protective garments for her incontinence.

Joan continued to take long walks, but due to obsessive walking she was unable to stop and return on her own. On two occasions, the family solicited assistance from the police to find and return her, yet they could not keep her in the house. Joan would climb through a window to get outside and walk. There were complaints from several neighbors that she took newspapers, children’s toys, and mail from their properties. During the clinic evaluation, Joan sat quietly and answered questions with either “yes” or “no” by shaking her head. The family was counseled to have 24/7 supervision and activities for her, including participation in an adult day program. The family made sure she had the charged GPS tracker on her at all times.
Characteristics of Moderate bvFTD
Demonstrated by Joan

- Decreased initiation of productive behavior: unable to plan and organize shower; diminished speech output
- Compulsive roaming with indifference to potential hazards or risks
- Disinhibited behavior/poor impulse control: took neighbor’s papers and mail
- Incontinence associated with disinhibited bladder due to the disease

Care Goals in the Moderate Stage

The primary goal in the moderate stage is safety. Caregivers need to anticipate things that may lead to injury of the person or others. Weapons, including guns, knives, fireplace pokers, etc., should be removed from the area as the person is too unpredictable and impaired to use them or leave them alone. Caregivers should expect to have occasional unpleasant interactions with neighbors and police as the person may tend to take things such as toys or bicycles from neighbors. It is also not uncommon for the person to enter a neighbor’s home without asking permission.

Driving should be curtailed, although some people with FTD tend to roam compulsively, unable to stop on their own. Plus, once stopped the person will become agitated and possibly aggressive until they are allowed to resume the movement. Most, but not all, can sleep at night but have issues with chronic muscle and joint pain. While generally safe, the person will be oblivious to common environmental, traffic, and human hazards. Many caregivers report the person follows a predictable route over and over throughout the day. A GPS tracking device can be invaluable in monitoring the person’s location.

A second goal is monitoring weight and nutrition. Many people with bvFTD go through a stage where they eat constantly, including non-food items. Caregivers report changing from meal preparations to hourly presentation of small plates or snacks. It is not uncommon for a person with bvFTD to raid the pantry or refrigerator eating a half gallon of ice cream or entire package of cookies in one sitting. This can lead to rapid significant weight gain where the person has difficulty moving, and to diarrhea and loss of bowel control. Locks can be purchased for cupboards and the refrigerator online at the Alzheimer’s Store.

A third goal is to try to maintain hygiene. Reminders to bathe, clean teeth, change clothing, get dressed, and change clothing when soiled can be a daily struggle and may result in caregiver injury from resistance. Caregivers need to understand that “no one ever died from not bathing” and act accordingly. Sometimes people will clean up if they understand they cannot go out in public unless clean and groomed. If resistance continues, speak with the physician about having a consultation with an occupational therapist (OT). OTs are specifically trained in task simplification to help ease problems with activities of daily living. It is important to remember that, while the person may have been immaculate before FTD, the disease dramatically changes the person’s approach to maintaining hygiene.

A fourth goal is to manage problem behaviors. It is important to distinguish between the behaviors that are simply symptoms of the disease, such as disinhibition and self-absorption, from those symptoms that indicate distress to the person with FTD or pose risks to the caregiver or family. The latter include anxiety, night waking, agitation, aggression, and anger. For the latter symptoms, meetings with the doctor, nurse practitioner, and other members of the care team can help to determine the best options for care, including use of medications. Care must be taken when administering drugs for anxiety as one class, the benzodiazepines, can increase disinhibition and acting out.

Advanced disease

Due to her parents advanced age and Joan’s increasing need for care, she was placed in an assisted living facility with a memory care unit. Joan had become resistant to receiving personal care and had developed a frightening stare that was mistaken for anger. While her parents were understandably concerned about the move, Joan had no difficulty adjusting to the new environment. She continued to comply with directions and allowed male staff to help her bathe and dress. Several weeks after admission, Joan began to undress in front of male residents, but did not resist when firmly told “no.” She no longer spoke, but would occasionally shake or nod her head. Occasionally she would yell or scream spontaneously, especially at night. Many interventions were tried, however, the only intervention that helped was acetaminophen 1000mg given twice daily. During this time, Joan started picking her nails until they bled, and grabbing food from the plates of other residents. Her physician prescribed a selective-serotonin reuptake inhibitor (SSRI) to help manage these repetitive behaviors and a staff member was assigned to monitor her at mealtimes. Staff also explored activities that would engage Joan, and try to distract her from picking her nails. They found she would stop when given picture and letter cards to sort. She was more likely to participate when the activities were individualized, and when a staff member sat beside her to get her started.

Care Goals in Advanced Disease

The primary goal of care in advanced disease is comfort and preparation for end-of-life. Attention must be paid to maintaining

Characteristics of Advanced bvFTD
Demonstrated by Joan

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<th>Characteristic</th>
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<tr>
<td>Disinhibited behavior/poor impulse control: sexual advances to male residents</td>
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<tr>
<td>Loss of verbal communication, yet spontaneous vocalizations</td>
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<tr>
<td>Compulsive and repetitive behavior: picking nails; grabbing food from others</td>
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Characteristics of Advanced bvFTD
cleanliness with the goals of preventing infection, skin breakdown, and maintaining nutrition. One tactic is to incorporate food in all activities. One facility reports that constantly offering small bits of food results in less weight loss and fewer episodes of choking.

A second goal is providing for safety. Falls, and resident-to-resident altercations, are not uncommon. While neither can be entirely eliminated, the use of adaptive devices and enhanced supervision can help to minimize the risk. Physical therapy can also help with developing safer ambulation and adaptive equipment. Careful notes about resident altercations, and supervising residents when exposed to triggers, can prevent resident-to-resident violence.

A third goal is to provide meaningful activities that stimulate the senses. This is accomplished using food, music, aromatherapy, and simple activities. Sitting one-on-one with a resident in advanced disease may provide a degree of emotional comfort. Providing staff education regarding the stare can help to increase more therapeutic resident-to-staff interaction.

**End-of-life / Hospice Care**

Medicare’s hospice eligibility criteria for dementia pose challenges to timely services for people with FTD because the criteria were built upon the progression of Alzheimer’s disease (AD). Although persons with FTD present differently from each other in the earlier stages depending on the variant, all forms of FTD tend to appear similar at end-of-life.

A hospice nurse visited Joan. Reviewing her medical records, the nurse determined that Joan fulfilled Medicare’s criteria for hospice eligibility. The nurse explored the goals of care with Joan’s parents. Although they never had a discussion with Joan about specific details regarding health care decisions, her parents used their best substituted judgment to identify that Joan would not choose aggressive interventions to prolong her life when there was little to any benefit to improve her condition. Each item on the health care directives (HCD) was discussed with the support of the hospice staff so that Joan’s parents could make informed decisions to honor Joan’s wishes. The completed document clearly communicated that Joan would not choose resuscitation, hospitalization, antibiotics or a feeding tube. Instead, the goals focused on aggressive comfort care so that Joan could live out her days safely and comfortably in the company of those who knew her best.

Joan’s medication regime was simplified to include only essential medications to maximize comfort. Routine acetaminophen was prescribed for stiffness and chronic pain issues. The staff used a non-verbal pain assessment tool to evaluate comfort.

The interdisciplinary hospice team focused on optimizing Joan’s quality of life by providing daily sensory pleasures based upon those she enjoyed throughout her lifetime. Favorite music, prayers and poetry kept her engaged for periods of time throughout the day. Joan’s diet was liberalized small frequent offerings of items she enjoyed most and tolerated safely. Her mother was encouraged to bring familiar items from the past, such as photos and other touchstones, to reminisce meaningful moments of her life. Staff reported that Joan’s screaming episodes, although not completely eradicated, diminished significantly within days after the aforementioned pharmacological and non-pharmacological comfort measures were initiated.

Joan developed aspiration pneumonia. She was not admitted to the hospital or administered antibiotics. Her comfort was maximized using medications to address fever, pain, and restlessness, while her favorite hymns softly played in the background to create a serene and supportive environment for everyone in the room. Shortly thereafter, Joan died a peaceful death surrounded by her family, some favorite long-term facility staff, and her hospice nurse. The hospice team supported Joan’s family and the nursing facility staff through the entire process, and referred her parents and children to the bereavement specialist for 13 months of follow-up care.

**Care Goals for End of Life**

Anecdotal evidence suggests that people with FTD and their families are commonly deprived hospice services until the final weeks before death, thus missing the benefits associated with hospice’s interdisciplinary expertise in holistic comfort care and support. The primary goal of end of life care is for a peaceful and comfortable death. This includes use of medications to control specific symptoms such as pain, fever or excess secretions. Careful positioning, skin care and massage can prevent joint pain and skin breakdown. Attention to food consistency can help to prevent choking and aspiration.

**Key Points**

1. Ten to twenty percent of people with dementia have FTD, a group of illnesses characterized by primary deficits in personality, language, and/or motor symptoms. There are three subtypes: behavioral variant; language decline; and motor decline. Behavioral variant is the most common.

2. People with bvFTD often do not respond to medications and interventions designed for people with Alzheimer’s disease, but do respond to interventions designed for their conditions including behavioral and pharmacologic measures.

3. Clinicians caring for people with FTD should begin a dialogue on best practices on diagnosis, care, and end of life to enhance outcomes in this population.

**Sidebar 1 Help for Families**

There are two booklets specifically designed to help families. The first is Frontotemporal Disorders: Information for Patient, Families, and Caregivers, a free educational booklet describing types and symptoms of FTD, is available from the National Institutes on Aging at http://www.nia.nih.gov/sites/default/files/frontotemporal_disorders_information_for_patients_families_and_caregivers_0.pdf

The second booklet The Doctor Thinks it is FTD. Now What? A Guide for Managing a New Diagnosis is published by the Association for Frontotemporal Degeneration. It provides families with an overview of how to organize and provide care. It is available through Association for Frontotemporal Degeneration at www.theaftd.org.

Because so many people with FTD have young family, the AFTD has several new resources for children and teens available at http://www.theaftd.org/life-with-ftd/children-and-teens. This includes booklets for parents to open discussion with their children and a telephone support group for children.
Additional information for families and professionals is available through The Association for Frontotemporal Degeneration, website www.theaftd.org

References
The Relationship Between Ankle Dorsiflexion Range of Motion and Elderly Fall Risks
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Midwestern University, College of Health Sciences,
Doctor of Physical Therapy Program

ABSTRACT
This pilot study investigated the relationship between ankle range of motion and fall risk, overall mobility, and leg strength in older adults who reside in assisted living facilities (ALFs). ALFs are underrepresented in the literature and this patient demographic is posing care management challenges to clinicians. The intervention group received stretching to the gastrocnemius/soleus muscles 3 days/week for 3 weeks. Statistical conclusions lacked significant changes with fall risks, but positive trends were calculated with the intervention group among most dependent variables. Caregivers should be educated on gastrocnemius/soleus stretching as a part of routine fall prevention best practices with older adults.

Keywords: falls, assistive living facility, geriatrics, ankle ROM, balance, LE strength, TUG, Tinetti POMA, fall prevention

Background and Literature Review
Falls among the elderly have become a national and international public health crisis. The World Health Organization reports that the frequency of falling increases with advancing age and frailty levels. In the United States (U.S.), the Centers for Disease Control (CDC) list older adult falls as a high priority area of research. In fact, the CDC indicates that falls are the “leading cause of injury death and the most common cause of nonfatal inquiries and hospital admission for trauma among people ages 65 and older.”

The sequelae of injurious falls among community dwelling older adults is a multi-factorial public health problem requiring further investigation. Economically, falls have significant consequences. The total direct cost of all fall injuries in the U.S. for people 65 and older in the year 2000 exceeded $19 billion. This financial toll on the U.S. healthcare system is expected to increase as the population ages and may reach $54.9 billion by the year 2020. Because the census bureau projects the elderly population to grow and reach 80 million by the year 2050, healthcare providers, researchers, and policy lawmakers have placed an increased focus on the prevention of elderly falls. Statistically, 2005 data from the CDC reported 3,284,671 unintentional injuries in those aged 65-85+. Of those unintentional injuries in older adults, there were 2,114,113 (64%) falls. Falls can lead to a loss of functional independence; a loss of independence in ambulation, transfers, or activities of daily living (ADLs) can lead to institutionalization. Once institutionalized, as many as 3 out of 4 nursing home residents fall each year. That is twice the rate of falls for older adults living in the community. Whether institutionalized or community-dwelling, older adults with Alzheimer’s disease (AD) fall more than twice as often as those without dementia. Due to factors such as reduced financial costs and the desire for a more residential atmosphere, many older adults and their families/guardians are opting for assisted living facility (ALF) placement as an alternative to traditional long-term care. Residents of ALFs are underrepresented in the rehabilitation literature, and this patient demographic is posing unique challenges to clinicians and care managers.

There is a battery of fall risk screening and outcome measures available for healthcare providers to employ. Numerous tools are referenced in the literature for their validity and reliability in an elderly population. However, few screening and outcome tools are tested in more than one setting and among all diagnostic categories. Furthermore, fall screening tools have not yet been validated on residents of ALFs. A systematic review by Scott et al reveals 38 multi-factorial assessment tools that cover a wide range of fall risk factors, and 27 tools that assess functional mobility through tasks related to gait, strength, and/or balance. For this study, the battery of fall screening assessment tools was narrowed down to two commonly used tools found in the geriatric literature. The investigator selected the Tinetti Performance Oriented Mobility Assessment (POMA-t) and the Timed Up and Go Test (TUG). Selection of these tools for this pilot study was based upon the following factors: 1) simplicity and relative efficiency of test administration, 2) participant direction following, 3) interprofessional recognition of both tools, 4) safety of participants, and 5) psychometric properties across a diverse population. The investigator also desired tests that could adequately serve as both screening and outcome measurement tools. A valid screening tool should be able to stratify risk and be sensitive enough to confirm the presence/absence of a condition or risk status. A valid outcome measurement tool not only confirms the presence of a condition or risk, but should be sensitive to change over time.

The POMA-t is a 16 item, 28 point fall risk prediction tool that has two sub-tests within it: the POMA Gait (POMA-g) has 7 items and the POMA Balance (POMA-b) has 9 items. The entire tool requires 10-15 minutes to administer but the POMA-b requires less than three minutes. Similar to other tools, the POMA-t has cut-off scores for fall risk and also normative data for older adults aged 65-80. Cut-off scores for determining fall risks from POMA-t scores are as follows: 19-21/28 for older adults (Sterke et al; Faber et al) and 11/28 for frail elders (Thomas et al). Minimal detectable change (MDC) for the POMA-t in older adults is 4 to 4.2, but it is not established with the frail elderly or individuals with Alzheimer’s disease (AD). Minimally clinically important differences (MCID) have not been established for the POMA-t. General responsiveness of the POMA-t is adequate with several studies reflecting sensitivity at 64-68% and specificity at 66-78% among older adults without Parkinson’s Disease or stroke. However, Sterke et al reported higher sensitivity of the POMA-t at 85% and sensitivity for the POMA-b at 70% in an ambulatory setting. The POMA-t is a 16 item, 28 point fall risk prediction tool that has two sub-tests within it: the POMA Gait (POMA-g) has 7 items and the POMA Balance (POMA-b) has 9 items. The entire tool requires 10-15 minutes to administer but the POMA-b requires less than three minutes. Similar to other tools, the POMA-t has cut-off scores for fall risk and also normative data for older adults aged 65-80. Cut-off scores for determining fall risks from POMA-t scores are as follows: 19-21/28 for older adults (Sterke et al; Faber et al) and 11/28 for frail elders (Thomas et al). Minimal detectable change (MDC) for the POMA-t in older adults is 4 to 4.2, but it is not established with the frail elderly or individuals with Alzheimer’s disease (AD). Minimally clinically important differences (MCID) have not been established for the POMA-t. General responsiveness of the POMA-t is adequate with several studies reflecting sensitivity at 64-68% and specificity at 66-78% among older adults without Parkinson’s Disease or stroke. However, Sterke et al reported higher sensitivity of the POMA-t at 85% and sensitivity for the POMA-b at 70% in an ambulatory setting.
nursing home population. Trends with sensitivity and specificity of the POMA-t are good when the tool is administered on a frailer, older population. Thomas et al reported sensitivity of the POMA-t at 83% and specificity markedly improved to 72% in frail elders. Like many other fall risk assessment tools, the intra- and inter-rater reliability of the POMA-t has been calculated in a wide variety of disorders. Intra-rater reliability (intraclass correlation [ICC] .84) and inter-rater reliability (ICC .692-.96) are good to excellent among older adults with the greatest among of variability reported for the POMA-b score. The major limitation reported in the literature is a high ceiling effect with the POMA-t.

The TUG test is a commonly used screening tool for mobility dysfunction and as a predictor of fall risk in the elderly. It is a simple test requiring under 3 minutes to administer, but provides the examiner information that is reliable and valid. Despite the context of test being different from the POMA-t and many other standardized tools, the TUG also has cut-off scores and normative reference data for community-dwelling older adults. Cuff-off scores for determining fall risks from TUG scores are as follows: >13.5 seconds among community-dwelling older adults. Cuff-off scores for determining fall risks from TUG scores are as follows: >13.5 seconds among community-dwelling older adults (Shumway-Cook et al), >15 seconds for adults who are already attending a falls clinic (Whitney et al), and >32.6 seconds with frail elders (Thomas et al). The MDC for the TUG is 4.09 seconds in subjects diagnosed with Alzheimer’s disease (AD). However, MDC for community dwelling older adults or the frail elderly has not been established. Similar to the POMA-t, MCID are also not established with the TUG. This tool has excellent reliability with test-retest (ICC .97), intra-rater reliability (ICC .92), and inter-rater reliability (ICC .91). The TUG has been shown to be useful with not only predicting future falls but also frequent “near-falls” in older adults with hip osteoarthritis. Herman et al cited that the TUG is the appropriate tool for clinical assessment of functional mobility favoring the TUG over several other commonly used fall screening tools such as the Berg Balance Scale (BBS) and the Dynamic Gait Index. This study further highlighted the applicability of the TUG to healthy community-dwelling older adults and stated that it is related to executive cognitive function. Sensitivity and specificity of the TUG have not been established in the general elderly population. The Rehab Measures website summarizes the TUG’s concurrent validity with other measures of function in the non-neurologically compromised older adult population: gait speed (r -.61, the Barthel Index of ADLs (r -.78), and the BBS (r -.81). Overall, the TUG’s ease of use, clinical utility, and strong psychometric properties identified in the literature is why the author selected it for inclusion in this ALF-based pilot study.

Although many fall risk factors are outside of the control of the healthcare team, a heightened awareness of ankle contracture prevention and management can have tremendous impact on averting injurious falls. Research and clinical practice has demonstrated that joint motion is a modifiable impairment that is effectively targeted with flexibility training for older adults. Ankle dorsiflexion contractures will impact an individual’s center of gravity, quality of gait, righting reactions, and transfer ability. The relationship between lower extremity (LE) contractures and standardized fall risk assessment tools is unknown.

Lower limb strength and function has been correlated with elderly falls. Although the focus of this investigation was on the relationship between ankle range of motion (ROM) and standardized fall risk assessment tools, pre- and post-test data on LE strength was also examined for change among groups. This secondary research question relates to length-tension relationships among agonist and antagonist muscle groups that are needed for unrestricted, volitional joint movement. Foot position such as the presence of a contracture influences the electromyographic (EMG) activity or strength output of lower limb muscles during gait. Evidence exists that antagonistic EMG measurements are influenced by impairments in ankle ROM. Maganaris et al concluded that flexibility training can result in stronger muscle contractions at end-range ankle angles through inhibition of antagonistic muscle groups. Therefore, the investigator speculated that the three week gastrocnemius and soleus stretching intervention would result in improvements in ankle dorsiflexion, and possibly ankle plantarflexion and knee extensor strength.

Older adults become more susceptible to equinus contractures following periods of bed rest such as from a hospitalization or time of protected lower extremity weight bearing, onset of neurologic conditions that induce hyper- or hypotonia, any gradual but prolonged reduction in activity or ambulation levels, and in women who have a history of or currently wear shoes with elevated heals. Formal fall risk screening and comprehensive examination of an older adult’s strength, ROM, balance, endurance, and gait is typically performed by a licensed physical therapist. Based upon applicable findings, a plan of care would be customized to the client’s needs. However, not all older adults who would benefit from physical therapy (PT) are immediately recognized and referred. The Centers for Medicare and Medicaid Services (CMS) has very restrictive reimbursement guidelines limiting the frequency, amount, and method in which an older adult can seek rehabilitation services. Thus, the current medical referral and payment models tend to be more reactive to a fall or injury, for example, rather than facilitating preventative models of care. Enabling a more proactive approach in identifying underlying impairments such as equinus deformities could potentially prevent injurious falls, institutionalization, and associated costs. Because time and financial resources are limited, more caregiver-focused research is needed to assist with recognition of signs that should prompt a need for medical consultation as well as “hands on” interventions that can prevent falls. Ankle contractures in the elderly are an example of caregiver-focused, impairment-based research that can possibly prevent recurring and injurious falls.

**Purpose**

There has been minimal research on the impact of DF ROM as it correlates with standardized fall risk tools or self/caregiver reported fall history. The purpose of this pilot study was to investigate the relationship between ankle range of motion and fall risk, overall mobility, and lower extremity strength in older adults who reside in ALFs. In essence, if improvements in ankle ROM correlate with reduction in fall risk as measured by fall risk assessment tools, then caregivers and non-PT clinicians can be proactive with fall prevention measures upon recognition of equinus deformities. The investigator hypothesized that improvements in ankle range of motion gained over a three week intervention period would correlate with concurrent improvements of Tinetti POMA and TUG scores. Ankle flexibility was the variable manipulated by this experimental cohort study. Both fall risk tools selected require participants to engage the muscles, joint receptors, and neuromuscular reaction
strategies of the foot ankle complex. A complete list of hypotheses is outlined in Table 1.

Subjects and Baseline Data

Upon approval from Midwestern University’s Internal Review Board (IRB), 30 ambulatory residents from a large, 100+ resident ALF in Glendale, AZ were recruited for participation in this study; 23 participants were consented. The mean age was 79.6 (SD 11.63) ranging from 57-94 years of age. Of the 23 participants, 19 were female, 4 were male. Participant fall histories were obtained and considered historically accurate after verification from two of the following four sources: 1) participant report, 2) medical record documentation, 3) confirmation by the ALF’s resident care manager, and 4) family or power of attorney report. Twenty-two participants (96%) experienced at least one fall in the prior 12 months. Reliability in reporting fall history varied among all four sources.

Nineteen participants (83%) had a baseline ankle plantarflexion contracture defined as one or more ankles limited to 0 degrees or less dorsiflexion ROM. Eighteen participants (78%) had baseline knee extensor strength deficiencies defined as one or more knees with less than 5/5 manual muscle test (MMT) grade. However, only 10 participants (43%) had baseline ankle dorsiflexor strength deficits using the same criteria. All except one participant (96%) had ankle plantarflexor strength deficiencies defined by this study as an inability to complete 10 bilateral heel raises while in the standing position.23,24 These ankle strength findings are consistent with the literature which outlines the prevalence of weak ankle plantarflexor muscles in older adults.25

At baseline, the mean TUG score for both groups was 42.9 seconds. The mean POMA-t score for both groups was 14.8. After comparisons with evidenced-based cutoff scores, both tools indicate that this sampled cohort possessed very high fall risks. All but two participants had physician confirmed presence of some type of dementia. One participant from the intervention group was hospitalized and withdrew from the study after baseline assessments were completed. This evened the number of participants to 11 in both groups.

Methodology

This was an experimental pre-/post-test cohort pilot study. All participants received the following pre- and post-tests from the same examiners: 1) passive ankle DF ROM with the knee extended and flexed using a 10° goniometer, 2) ankle dorsiflexion, plantarflexion, and knee extension strength using a 0-5 Manual Muscle Test (MMT) scale, 3) the TUG (average of two trials), and 4) the Tinetti POMA-t. Goniometric measurements were obtained according to Norkin and White’s guidelines using the lateral malleolus as the fulcrum, the proximal arm in line with the fibular head, and the distal arm parallel with the fifth metatarsal.26 After the baseline evaluations, research participants were randomly assigned into either the control or treatment group. Participants selected for the intervention group were scheduled to receive manual (therapist provided) passive, stretching to the gastrocnemius and soleus muscles of both ankles 3 days/week for 3 weeks. A licensed physical therapist with fifteen years of experience performed all stretching interventions. Treatment consisted of 6-8 minute individual stretching sessions performed in the seated or supine position with each stretch lasting 20-30 seconds, 5 repetitions bilaterally. The gastrocnemius muscle stretch was performed with the participant’s knee extended and the soleus muscle stretch was performed with the knee flexed at approximately 90 degrees. Each stretch was performed by providing a downward force on the calcaneus while simultaneously pushing the foot into an upward, dorsiflexed position (figure 1). Due to factors outside of the investigator’s control, the intervention group received an average of 7.5 of the 9 scheduled (range 5-9) stretching sessions.

Figure 1

Results

The significance of differences among pre- and post-test TUG and POMA scores, LE MMT, and ankle ROM variables where calculated for both the control and intervention groups using the Kruskal-Wallis nonparametric statistical test. Results indicate statistical significance (p < .05) only for right lower extremity (RLE) ankle DF ROM with the knee extended (p = .004) and flexed (p = .027). Although unable to reject the null hypothesis for the remaining variables (table 1), the mean change in pre-/post-test scores for the TUG (-10.5 seconds), POMA-g (+1.45), POMA-b (+1.45), POMA-t (+2.91), and DF and knee extension MMT strength scores indicate positive outcome trends with the intervention group. These results are reflected in table 2. The mean change TUG times greatly exceed the MCD, but the mean change in POMA-t scores falls short of the MDC. As stated previously, the MCID are not established for either tool.11

Conclusions

Despite the use of a convenience sample, the presence of ankle contractures (19 of 23), history of falls (22 of 23), and fall risk as measured by the TUG (21 of 23 > 13.5 sec) and POMA-t (18 of 23 < 21) provided face validity to this investigation. Variability of this study’s participants and the limited sample size prohibited further statistical inferences. A follow-up study which includes a larger sample size with stricter inclusion or categorical criteria such as accounting for the large variability in age, comorbidities, cognition, and overall functional status of ALF residents is needed with future investigations. Although the POMA-t is classically recognized interprofessionally, it is possible that other validated fall risk outcome tools may have been more sensitive to detecting change in this cohort. Nonetheless, the POMA-t appears to have served as an adequate fall screening tool, and the TUG appears to have served as an adequate fall screening and outcome measurement tool with this ALF population.
Table 1. Hypothesis Test Summary

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Test</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 The distribution of TUG difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.108</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>2 The distribution of Tinetti-Balance difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.425</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>3 The distribution of Tinetti Total difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.128</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>4 The distribution of Ankle DF RLE - knee EXT difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.004</td>
<td>Reject the null hypothesis</td>
</tr>
<tr>
<td>5 The distribution of Ankle DF LLE - knee EXT difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.061</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>6 The distribution of Ankle DF RLE - knee FLEX difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.027</td>
<td>Reject the null hypothesis</td>
</tr>
<tr>
<td>7 The distribution of Ankle DF LLE – knee FLEX difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.999</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>8 The distribution of Ankle PF MMT (reps) difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.622</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>9 The distribution of Knee Ext LLE MMT difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.161</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>10 The distribution of Knee Ext RLE MMT difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.247</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>11 The distribution of Ankle DF LLE MMT difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.120</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>12 The distribution of Ankle DF RLE MMT difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.203</td>
<td>Retain the null hypothesis</td>
</tr>
<tr>
<td>13 The distribution of Average Knee Ext R/LLE MMT difference is the same across categories of Group.</td>
<td>Independent Samples Kruskal-Wallis Test</td>
<td>.256</td>
<td>Retain the null hypothesis</td>
</tr>
</tbody>
</table>

Significance level is 0.05

Table 2. Mean Pre-/Post-test Group Differences

<table>
<thead>
<tr>
<th></th>
<th>Control (n=11)</th>
<th>Intervention (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUG (seconds)</td>
<td>-0.26 (range 41.7 to -53.3)</td>
<td>-10.50 (range 0.4 to -53.6)</td>
</tr>
<tr>
<td>POMA-b</td>
<td>-0.09 (range 4 to -6)</td>
<td>1.45 (range 2 to -2)</td>
</tr>
<tr>
<td>POMA-g</td>
<td>0.45 (range 4 to -2)</td>
<td>1.45 (range 6 to -3)</td>
</tr>
<tr>
<td>POMA-t</td>
<td>0.36 (range 6 to -4)</td>
<td>2.91 (range 10 to -5)</td>
</tr>
<tr>
<td>Ankle DF ROM R/L -knee extended</td>
<td>-1.95 (range 16.5 to -17)</td>
<td>4.23 (range 12.5 to -0.5)</td>
</tr>
<tr>
<td>Ankle DF ROM R/L -knee flexed</td>
<td>-1.05 (range 10.5 to -10.5)</td>
<td>3.73 (range 11.5 to 0.5)</td>
</tr>
<tr>
<td>Knee Ext MMT R/L</td>
<td>0.26 (range 1.85 to -0.375)</td>
<td>0.44 (range 1.25 to 0.0)</td>
</tr>
<tr>
<td>Ankle DF MMT R/L</td>
<td>0.01 (range .75 to -0.5)</td>
<td>0.22 (range .625 to -0.5)</td>
</tr>
<tr>
<td>Ankle PF MMT (reps)</td>
<td>1.27 (range 10 to -1)</td>
<td>0.27 (range 3 to -3)</td>
</tr>
</tbody>
</table>
The investigator observed variable physical and/or cognitive statuses of most participants throughout the course of this study including the day of the post-test evaluations. Concurrent implementation of a mini-mental state examination, for example, could have assisted the investigator in reaching more definitive conclusions about the effect of dementia and/or variable cognitive statuses on study outcomes. Various factors other than cognition limited the mean intervention sessions to 7.5 of 9 scheduled (range 5-9).

Results of this study also reveal a possible connection between ankle contractures, response to stretching, and limb dominance that is worthy of further investigation. Although passive stretching was implemented bilaterally and the baseline severity of equinus contractures appeared to be equally distributed among both limbs, only the right LE showed statistically significant improvement. The investigator did not assess the foot and ankle complex for possible talocrural or midtarsal joint mobility restrictions. Therefore, arthokinematic impairments may not have been responsive to muscular-focused stretching interventions and there may have been an unequal distribution of joint vs. soft tissue restrictions unknown to the investigator.

It is well documented that socialization and psychological health can influence one’s desire to become or remain physically active. It is well documented that socialization and psychological health can influence one’s desire to become or remain physically active. In this study, with a male physical therapist being involved in a predominantly female ALF community, gender or tester bias may have influenced study outcomes. Additionally, it is difficult to completely rule out other threats to internal validity as the investigator was unable to eliminate communication between control and intervention group participants, account for history, eliminate testing bias or practice effects in this ALF community. A Hawthorne effect was possible among control group members. For example, the presence of a physical therapist could have prompted control group participants to resume a previously prescribed home exercise or a group exercise program at the ALF. Greater than 50% of control group members improved their quadriceps strength as measured by knee extensor MMT and demonstrated improved balance and mobility as measured by TUG and POMA-b scores.

Clinical Relevance

Screening for ankle contractures and proving prophylactic ankle flexibility exercises has the potential to prevent falls and enhance the overall mobility status of older adults as measured by reliable and valid fall screening and outcome tools. ALFs and Personal Care Homes are partnering with home health agencies, traveling physician and nurse practitioner groups, physical therapists, and independent consultants to meet the health needs of their residents. Healthcare providers should consider ankle ROM an important factor as relates to functional performance including but not limited to transfer abilities, ambulation/locomotion, ADL participation including functional reach, and performance on standardized fall risk tools such as the TUG and POMA-t, for example. In conjunction with other factors that predispose an older adult to falls, qualified healthcare professionals should educate patients, caregivers, and family members on the recognition of ankle contractures and their potential contribution to injurious falls. It is recommended that caregivers and families be educated on gastrocnemius and soleus exercises as a part of routine fall prevention best practices with older adults. Contracture management, fall risk reduction activities, and patient/caregiver education are all reimbursable interventions under the Part A and Part B Medicare benefit, but necessitate referral and care plan approval from a physician or designated non-physician provider. Passive ankle stretching exercises are generally well-tolerated and can be performed on older adults who have difficulty following one-step commands.

None of the 23 sampled participants were receiving any form of rehabilitation despite clear indications of their heightened fall risks. Despite the presence of 24 hour per day caregivers, this investigation confirmed the ongoing vulnerability of ALF residents to adverse medical events and the need for additional research in this care setting. Once consulted, clinicians should anticipate the need to be flexible with their schedule and the need to gather relevant information from a variety of sources when evaluating residents in ALFs. Because variable functional statuses were observed over the course of this investigation, it is recommended that clinicians arrive at assessment conclusions and develop goals over a two to three day examination/observation window to maximize accuracy of ALF-based client plans of care and referrals.

References:
15. Thomas JJ, Lane JV. A pilot study to explore the predictive validity of 4 measures of falls risk in frail elderly patients. Archives of Physical Medicine
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Richter’s Transformation – An Uncommon Complication of a Common Geriatric Disease

Anju Nair, MD, Sarah McGinn, MD and Rosemary Browne, MD

Introduction:

Chronic lymphocytic leukemia (CLL) is the most common leukemia seen in patients over the age of 65 years. Prognosis depends on the stage of the cancer at diagnosis, and treatment ranges from simple observation to aggressive chemotherapy. In the past, CLL was believed to be an indolent disease associated with a prolonged benign clinical course, with an expected survival up to 20 years. As the prevalence of CLL has risen in concert with the aging population, complications are being seen with increasing frequency, now in up to 30% of cases. Common developments with CLL include anemia, thrombocytopenia, recurrent infections and constitutional symptoms such as fatigue and weight loss. An uncommon complication of CLL is Richter’s Transformation (RT), the development of high-grade non-Hodgkin’s lymphoma in the setting of CLL or small lymphocytic lymphoma. The incidence of RT is estimated at 2-9% in those patients with CLL, and portends a worse prognosis.

We present a case of a patient with a history of CLL, successfully treated with chemotherapy, who presented with an intestinal perforation secondary to the development of a primary gastrointestinal diffuse large B cell lymphoma (DLBCL).

Case Description:

A 72-year-old female with a history of CLL, in remission for 13 years after chemotherapy, presented to the emergency department with abdominal pain. The patient reported a four-day history of progressive symptoms including dull, generalized abdominal pain, nausea, constipation, and abdominal distension. Physical examination revealed normal bowel sounds, diffuse abdominal tenderness without guarding or rigidity, guaiac positive stool, and was negative for palpable lymph nodes or hepatosplenomegaly. Lab studies revealed a normal CBC and below normal LDH of 118. Computerized tomography of the abdomen with oral and IV contrast revealed a pneumo-peritoneum, thickened small intestinal walls, and mesenteric and retroperitoneal lymphadenopathy (See Figure 1a and 1b). The surgery service was consulted, and the patient underwent an emergent exploratory laparotomy. Three areas of surgical disease were identified in the proximal ileum, two foci demonstrating mucosal perforation and one with transmural necrosis. A 10.5 X 10.0 X 5.0 cm region of small bowel was resected, followed by successful intestinal reanastomosis.

Surgical pathology revealed minimal normal bowel mucosa, with large areas of mucosal ulceration and necrosis, diffuse increased vascularity, and sheets of a lymphoid infiltrate that extended from the mucosal surface to the serosa. The infiltrate was composed primarily of large lymphocytes with irregular nuclear contours, pleomorphism, a high NC ratio and prominent nucleoli (see Figure 2a and 2b). Further histological examination revealed diffuse mucosal infiltration with cells of both classic CLL morphology, and also large atypical lymphoid cells with prominent nucleoli consistent with diffuse large B –cell lymphoma (DLBCL) (see Figure 3a and 3b). Immunophenotypal characterization of the transformed cells showed malignant infiltrate of DLBCL with a non-germinal center subtype (CD10 negative, BCL-6 positive, MUM-1 positive). Further staging evaluation failed to demonstrate extra intestinal RT. After an uneventful postoperative course, the patient was treated with two cycles of R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, and Prednisone) therapy. Clinical remission was achieved.

About one year following the initial RT diagnosis, a follow up bone marrow aspirate revealed 1% CD5+, CD23+ CLL population with 10-20 % CD20 DLBCL population. The patient currently awaits PET scanning to evaluate disease burden and Rituximab has been restarted for progressive disease.

IMAGING:

Figure 1a: The perforated small bowel loop is most likely located in the left upper quadrant. Multiple foci of nearby extraluminal air are seen.
Focal wall thickening and dilation are seen in the remaining small bowel loops.

Figure 1b: Multiple thick walled small bowel loops seen in the abdomen and pelvis. The most prominent of these is located in the upper pelvis centrally.
Figure 2a: Intestinal Biopsy showing CLL Cells
High power view: predominantly small lymphocytes with scant cytoplasm and condensed clumped chromatin, and occasional slightly larger prolymphocytes with more dispersed chromatin and prominent nucleoli.

Figure 2b: CLL: A proliferation of small lymphocytes that are CD20 positive B cells which co-express CD5 and CD23 (classic CLL immunophenotype and morphology).

Figure 3a: Area of bowel demonstrating Richter’s transformation.
High power view shows a diffuse infiltrate of large atypical cells, some with prominent nucleoli.

Figure 3b: Richter’s Cells: The large atypical cells are CD20 positive B cell that express CD5, indicating a Diffuse large B-cell lymphoma, retaining CD5+ from CLL cell.

Discussion:

Chronic lymphocytic leukemia (CLL) is a lymphoid neoplasm that presents with progressive accumulation of functionally incompetent lymphocytes of monoclonal origin. Diagnosis involves examination of the peripheral blood smear, revealing lymphocytosis with small, mature appearing lymphocytes and a dense nucleus, without discernible nucleoli. In CLL, immunophenotypic analysis by flow cytometry will show CD19/CD23 (B-cell associated antigens), CD5 (T-cell associated antigen) and low levels of surface membrane immunoglobulin. CLL cells are negative for Cyclin D1, CD10, FMC7, CD22, and CD79b. Disease is staged using the Rai system in the United States, and is based on the patient’s lymphocytosis, lymphadenopathy, organomegaly, anemia and thrombocytopenia. With early stage CLL, no therapy is indicated and the median expected survival is greater than 10 years. Advanced stage disease is treated using radiation and chemotherapy, with an expected survival of 18 months to five years. CLL can be complicated by multiple co-morbidities including infection, cytopenias, and even a second neoplasm. The transformation of CLL to diffuse large B cell lymphoma exclusively within the intestine, however, is very uncommon.

Richter’s Transformation was first described by Maurice N. Richter.
in 1928, who observed rapidly growing lymphadenopathy and hepatosplenomegaly in a patient with known CLL. Histologically, he documented the presence of large cells with prominent nucleoli and small lymphocytes in sections of the spleen, liver and lymph nodes. In 1962, the term “Richter’s Transformation” was coined to describe the histological progression of CLL to a “malignant reticulopathy” 3. RT is now defined as the development of typically high-grade non-Hodgkin’s lymphoma (NHL), Hodgkin’s disease, prolymphocytic leukemia, or acute leukemia in patients previously diagnosed with CLL. The reported incidence of RT in CLL is approximately 5%, and is seen more frequently in patients older than 50, especially those who have received chemotherapy for CLL in the past 2. The median time from the diagnosis of CLL to transformation has ranged from 2-4 years 1.

The etiology of this malignant transformation remains unclear. It is believed that certain triggers can cause multiple genetic defects, such as mutated p53 tumor suppressor genes or p21 mutations, which ultimately induce CLL cells to transform and proliferate. These triggers may be viral infections such as Epstein Barr and chromosomal abnormalities. Other postulated triggers include MYC locus abnormalities, unmutated immunoglobulin heavy chains (IGHV), non-del13q cytogenetics, CD38 gene polymorphisms, stereotypy, and VH4-39 gene usage 3,4,5.

Much debate also exists regarding the origin of specifically intestinal DLBCL in patients with history of CLL. It remains unknown whether this transformation to DLBCL evolved from a leukemia cell clone or is an independent and separate neoplasm. Molecular analysis has yet to establish a clonal relationship between CLL and digestive RT3,4,5.

RT most commonly occurs in the lymph nodes or bone marrow of CLL patients. Few cases of extra nodal involvement have been reported and include such diverse sites as CNS, eye, skin, testes, GI tract, kidney, and lung. In 2001, Parrens et al noted merely 10 cases of documented primary digestive RT, including intestinal, gastric and rectal sites 3.

Common symptoms of nodal RT include fevers without infection, an increased LDH, and rapidly enlarging lymph nodes, often with splenomegaly and hepatomegaly. Anemia, thrombocytopenia, and leukopenia may also occur; these complications, however, are most likely secondary to the underlying CLL. RT is often diagnosed by excisional lymph node biopsy. With nodal RT, therapeutic strategies include intensive chemotherapy, monoclonal antibody therapy and even stem cell transplantation. Response rates in nodal RT have been documented to vary from 5-38% with medial survival ranging from 5 to 8 months. With intestinal involvement, RT typically presents as recurrent gastric ulcer disease, upper or lower gastrointestinal bleeding, intestinal obstruction or acute perforation. It is diagnosed by histopathologic exam of the digestive mucosa. Previously studied digestive Richter’s cells demonstrated blast-like large cells with vesicular nucleus with prominent nucleoli, finely dispersed chromatin and even the presence of some residual CLL cells in the sample 4,5,6.

Primary digestive RT has a better prognosis than nodal RT. In cases that have been studied, median survival after chemotherapy is 22 months, with a range of 5-48 months. Surgical resection of the lymphoma and chemotherapy may even lead to remission 3.

This case demonstrates the uncommon occurrence of primary intestinal RT in a geriatric patient with a distant history of CLL. Although rare, RT should be considered in any patient with a history of CLL who presents with an intestinal tumor.

References:
Cognitive Behavioral Interventions for Insomnia in Older Adults
Andrea S Chambers, PhD, Arizona State University
Dana R Epstein PhD, RN, Phoenix VA Health Care System, Arizona State University

Previous editions of Elder Care have reviewed the general problem of sleep disorders in older adults and the approach to drug therapy for insomnia. This edition focuses on behavioral treatments for insomnia.

Cognitive behavior therapy for insomnia (CBT-I) is recognized as the first-line treatment for chronic sleep problems. CBT-I focuses on the compensatory behaviors and hyperarousal or anxiety that disrupt sleep regulation (sleep homeostasis and circadian rhythm) and maintain chronic insomnia. Although CBT-I has been tested primarily as part of a multi-component intervention, one trial compared CBT-I alone to multi-component interventions and found both to be equally effective.

This article describes the most commonly used approaches to CBT-I. They include stimulus control therapy, sleep restriction therapy, cognitive therapy, relaxation training, and sleep education and hygiene.

**Stimulus Control Therapy (SCT)**

For the person with insomnia, the bed and bedroom become associated with cues for wakefulness, often due to a myriad of wakeful activities done in bed such as watching TV, reading, worrying, and trying to sleep. SCT is a series of instructions focused on re-associating the bed and bedroom with sleep. Patients are encouraged to use internal cues (feeling sleepy) to signal bedtime rather than using external cues (such as a TV program is over). They are also encouraged to get out of bed when feeling frustrated about not falling asleep to decrease arousal and condition the bed for sleepiness and sleep, rather than for wakefulness.

SCT involves giving instructions to patients about sleep habits. It is important to note, however, that SCT is more effective when patients receive explanations about the rationale for these instructions, rather than simply giving them instructions as a handout. The instructions include:

- First, one should only lie down in bed when sleepy and intending to go to sleep. The bed should only be used for sleep and for sexual activity. The bed should not be used for reading, watching TV, eating, or worrying.
- Second, once in bed the lights should be turned off with the intention of going to sleep. If sleep does not ensue, don’t watch the clock. Rather, get out of bed, go to another room, and engage in a quiet activity until drowsiness occurs. Then return to the bed for sleep. If sleep again does not occur, get out of bed again. Repeat these steps as often as needed throughout the night. The purpose is to associate the bed with sleep, rather than with inability to sleep.
- Third, set an alarm to wake up at the same time every morning. This should be done no matter how little sleep occurs during the night. The goal is to help the body acquire a consistent sleep rhythm.
- Fourth, naps should generally be discouraged to prevent reduction of the sleep drive. However, some older adults, especially those with chronic medical conditions that cause fatigue, may benefit from judicious use of daytime naps. Table 1 gives guidelines for appropriate napping.

**Table 1. Nap Guidelines for Older Adults with Insomnia**

- Nap only in your bed.
- Nap only once each day.
- Nap for no longer than 30 minutes. Use an alarm or have someone wake you 30 minutes after you lay down to nap.
- Nap 7-9 hours after morning awakening. For example, if you wake up at 6 am, nap between 1-3 pm but no later.

The “Take a Nap” website provides guidance about the best time to nap based on morning wake-up time. It focuses on the optimal combination of deep sleep and rapid eye movement sleep. See [http://saramednick.com/htmls/book/napwheel.htm](http://saramednick.com/htmls/book/napwheel.htm)

**TIPS FOR DEALING WITH INSOMNIA IN OLDER ADULTS**

- Recommend behavioral therapies as the first-line treatment for insomnia.
- Education about sleep and good hygiene are necessary and important, but often not sufficient on their own as treatment for insomnia. Specific behavioral therapies should also be implemented, including stimulus control, sleep restriction, cognitive therapy, and/or relaxation training.
- Daytime napping should generally be discouraged, but if necessary because of chronic medical conditions that cause fatigue, use the nap guidelines shown in Table 1.

The contents of this Elder Care do not represent the views of the Department of Veterans Affairs or the United States Government.
Continued from front page

Sleep Restriction Therapy (SRT)

Patients with insomnia spend extended time awake in bed. SRT consolidates sleep by limiting a patient’s time in bed to the average reported sleep time across a week or more of sleep diaries.

A regular bedtime and wake time are established. In weekly treatment sessions, bedtime is adjusted 15-30 minutes earlier based on the total sleep time reported from the diaries. Wake time remains constant to help set the circadian clock and build the sleep drive.

There are contraindications to the use of SRT. The most important are seizure disorders, bipolar disorders, and excessive daytime sleepiness.

A milder variant of SRT, called sleep compression, gradually reduces time in bed and is useful for older adults. But both SRT and sleep compression require detailed attention to sleep diaries and skill in prescribing time in bed. They are best suited for implementation in behavioral health specialty settings.

Cognitive Therapy (CT)

In CT, the therapist is on the lookout throughout insomnia treatment for statements which suggest that a patient either has misconceptions about sleep or holds beliefs about sleep that increase arousal and contribute to difficulties falling asleep or maintaining sleep. The therapist addresses these thoughts through education about sleep, gradually challenging and modifying the patient’s thoughts, or by setting up “experiments” in which patients can test out their beliefs.

Relaxations Training (RT)

RT uses a variety of relaxation methods to reduce arousal and facilitate sleep. These methods include progressive muscle relaxation, diaphragmatic breathing, guided imagery, and meditation. These should be performed in low-light environments to allow for endogenous regulation of melatonin. Other strategies to support arousal reduction include setting aside 15-30 minutes early in the evening to problem solve, keep a journal, or create to-do lists so worrisome concerns do not emerge at bedtime.

Patients are also instructed to take 30-60 minutes before bedtime to unwind and engage in quiet yet pleasurable activities to establish a relaxing transition to sleep.

Sleep Education and Hygiene

Sleep education involves providing information about sleep that lays a foundation for the active treatment recommendations made in SCT, SRT, and RT. Education focuses on issues such as sleep architecture, sleep regulation, how insomnia develops, and ineffective sleep behaviors.

Sleep hygiene is a set of healthy sleep practices such as avoiding alcohol near bedtime, avoiding caffeine after noon, and not watching the clock when awake during the night. Older adults, who have a tendency towards an advancing phase shift in their circadian rhythm, are encouraged to expose themselves to bright light in the evening.

While education and hygiene are important and necessary for enhancing a patient’s understanding about the rationale behind and effectiveness of sleep therapy, they are generally insufficient as a treatment on their own. Some resources for patients are shown below in Table 2.

Table 2. Resources for Patients Who Have Insomnia

- How to find a clinician certified in behavioral sleep medicine: http://www.absm.org/bsmspecialists.aspx

References and Resources


ACOVE Quality Indicators

If a vulnerable elder presents with new onset of one of the following symptoms: sad mood, feeling down, insomnia or difficulties with sleep, apathy or loss of interest in pleasurable activities, complaints of memory loss, unexplained weight loss greater than 5% in the past month or 10% over 1 year, or unexplained fatigue or low energy, THEN the patient should be asked about or treated for depression, or referred to a mental health professional within 2 weeks of presentation.
Heart failure (HF), is a common clinical syndrome in older adults, accounting for over 1 million annual hospitalizations, most of which are considered preventable. It also has the highest 30-day hospital readmission rate of any medical condition. Given the growing aging population, increasing lifespan, and longer survival with cardiac disorders, systematic and cost-effective approaches to outpatient HF management must be implemented to reduce readmissions. This edition of Elder Care will review some of those approaches.

### Daily Monitoring and Targeted Intervention

Education should be provided about daily monitoring for the signs/symptoms of worsening HF. Patients/caregivers should be taught about early signs and symptoms of HF exacerbation that often occur in the days and weeks prior to re-hospitalization (Table 1). Interventions can then be made to stabilize the patient to reduce the risk of re-hospitalization.

Patients should weigh themselves daily and monitor for increasing symptoms. Patients and health care providers should establish a contact protocol to communicate symptoms or weight changes, either by phone or with biomonitoring equipment. Diuretic dosing protocols, based on weight gain and symptoms, can also be established.

### Medication Management

Standard medical treatment of heart failure includes beta blockers, angiotensin converting enzyme (ACE)-inhibitors or angiotensin receptor blockers (ARBs), and diuretics. Clinicians should prescribe generic forms of these medications to reduce treatment cost, and try to simplify treatment regimens by prescribing medications for use on a once daily basis whenever possible. Medications should be started at low doses and increased to treatment targets, as tolerated. In addition, some medications carry risk for patients with HF, and should be avoided or used with caution (see Table 2, on reverse side).

For medications to be effective, however, clinicians must assure that patients and/or their caregivers have an adequate understanding of how medications are to be taken. Education should be provided about the side effects of HF medications (e.g., urinary frequency with diuretics at night), the importance of medications for HF management, and the need to adhere to medication regimens. Multi-day medication box set-ups are often helpful in fostering adherence, though not for diuretics requiring frequent dose changes. For patients with limited literacy or vision problems who have difficulty reading labels, “talking” medication bottles are available.

As already mentioned, medication titration targets based on weight gain and symptoms should be established for diuretics. Furosemide is the most commonly used diuretic for treating HF, and is an exception to the aforementioned recommendation to seek once-daily dosing regimens. Due to its short half-life, furosemide is better taken 2-3 times daily.

### TIPS for Managing Heart Failure in the Home and Community

- Recommend that patients with heart failure monitor their weight daily, and report any weekly weight gain of more than two pounds. Such abrupt weight gain is often a warning sign that heart failure decompensation will occur.
- Recommend that patients with heart failure report symptoms of increasing edema, nocturnal edema, decreased exercise intolerance, or lightheadedness. As with weight gain, these symptoms may indicate decompensation.
- Assure that patients and/or caregivers understand when and how heart failure medications should be taken. Provide strategies for adherence when needed.
- Recommend sodium restriction of no more than 2.3-2.5 gm/day for patients with stable heart failure.

### Table 1: Signs/Symptoms of Heart Failure that occur in the Days and Week Prior to Decompensation and Hospitalization

<table>
<thead>
<tr>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight gain &gt;2 lbs/week</td>
</tr>
<tr>
<td>New or increasing ankle edema</td>
</tr>
<tr>
<td>New or worsening exercise intolerance</td>
</tr>
<tr>
<td>New or worsening nocturnal dyspnea</td>
</tr>
<tr>
<td>Lightheadedness</td>
</tr>
</tbody>
</table>

For example, if worsening of signs/symptoms are mild, patients can increase their diuretic dose and/or frequency on their own, based on those protocols, while maintaining their sodium-restricted diet. If weight gain or symptoms are more severe, the patient’s health care provider would be notified and may consider a home or office visit.

**February 2014**

**ELDER CARE**

A Resource for Interprofessional Providers

Heart Failure Management - In the Home and Community

Rostam Khoubyari, MD and Jane Mohler PhD, MSN, NP-c, University of Arizona Center of Aging
per day in split doses, rather than taking the entire daily dose at one time.

For example, if a patient responds to 20 mg of furosemide, the frequency may be titrated upward to 20 mg two or three times a day during exacerbations, rather than increasing the dose to 60 mg on a once daily basis.

**Dietary and Lifestyle Counseling**

Clinicians and care teams should provide counseling on sodium and fluid-restricted diets. The American Heart Association recently recommended (2013) sodium restriction to < 1.5 grams/day. However, the benefit of sodium restriction in geriatric HF is controversial, the current recommendation for sodium restriction in community-dwelling patients is 2.3-2.5 grams/day. Some evidence suggests that a more aggressive restriction may be detrimental, particularly for patients with decompensated heart failure. To achieve this goal, patients with HF and those who prepare food for them need to understand the need to avoid table salt, to recognize hidden sources of sodium, to learn how to read nutrition labels, and should know about salt substitutes.

**Tobacco and Alcohol**

Provide counseling on smoking cessation and alcohol intake. Recommend limiting alcohol consumption to no more than 2 drinks daily for men and 1 drink for women. Inquire about smoking at each encounter. Urge referral to smoking cessation program for those who smoke.

**A Multidisciplinary Approach**

A multidisciplinary approach using an interprofessional team (nurses, dieticians, social workers, pharmacists, physician, and others) can reduce re-hospitalization and costs of care, and improve quality of life through preemptive management strategies. These include the self-management approaches discussed earlier, and should also address barriers to self-care that may be present (Table 3).

### Table 2. Medications of Concern for Patients with HF

<table>
<thead>
<tr>
<th>Medication</th>
<th>Concern for Patients with HF</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDs</td>
<td>Fluid retention with HF exacerbation; impaired renal function; impaired responses to ACE inhibitors and diuretics</td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td>Negative inotropic effects</td>
</tr>
<tr>
<td>Thiazolidinediones</td>
<td>Fluid retention with HF exacerbations</td>
</tr>
<tr>
<td>Metformin</td>
<td>Lethal lactic acidosis</td>
</tr>
<tr>
<td>Phosphodiesterase type-5 inhibitors</td>
<td>Use contraindicated concomitantly with nitrates due to risk of hypotension</td>
</tr>
<tr>
<td>Cardiotoxic chemotherapy agents</td>
<td>Impaired systolic function</td>
</tr>
<tr>
<td>2nd generation antihistamines</td>
<td>QTc interval prolongation suggested for clemastine, loratadine</td>
</tr>
<tr>
<td>Theophylline</td>
<td>Arrhythmia</td>
</tr>
</tbody>
</table>

### Table 3. Barriers to Self Care in Patients with HF

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Recommended Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited financial resources</td>
<td>Social service agency’s assistance</td>
</tr>
<tr>
<td>Limited health literacy</td>
<td>Use teach-back to assure understanding by patients and caregivers about what needs to be done</td>
</tr>
<tr>
<td>Management by multiple clinicians</td>
<td>Avoid contradictory instructions to patient through use of electronic medical record available to all participating clinicians, with care plan delivered to patients by primary care clinician</td>
</tr>
<tr>
<td>Mood disorders (depression and anxiety)</td>
<td>Appropriate pharmacologic and non-pharmacologic interventions</td>
</tr>
<tr>
<td>Multiple comorbidities</td>
<td>Optimize and simplify medical management</td>
</tr>
<tr>
<td>Cognitive Impairment</td>
<td>Assure safe and supportive environment, simplify regimen</td>
</tr>
</tbody>
</table>

**References and Resources**


**ACOVE Quality Indicators**

If a vulnerable elder has symptomatic heart failure and left ventricular ejection fraction of 40% or less, THEN he or she should be offered treatment with an ACE inhibitor.

If a vulnerable elder has newly diagnosed heart failure, THEN education about disease management should be provided and documented.

If a vulnerable elder is under the outpatient care of two or more physicians, and one physician has prescribed a new prescription medication or a change in medication (medication termination or change in dosage), THEN subsequent medical record entries by the non-prescribing physician should acknowledge the medication change.

**Interprofessional care improves the outcomes of older adults with complex health problems**

Editors: Rosemary Browne, MD; Mindy Fain, MD; and Barry D. Weiss, MD

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Supported by: Donald W. Reynolds Foundation, Arizona Geriatric Education Center and Arizona Center on Aging
Lung Cancer Screening in Older Adults
Mary Reid, PhD; Samjot Dhillon, MD; Kaseem Harris, MD; Roswell Park Cancer Institute, Buffalo, NY

The National Lung Cancer Screening Trial
Since the results of the National Lung Screening Trial (NLST) were published in 2011, lung cancer screening has taken on new widespread support. The NLST enrolled more than 50,000 asymptomatic adults between the ages of 55-74 years who had at least 30 pack-years of smoking exposure, including former smokers who had quit within the past 15 years. Enrollees were randomized to receive 3 annual screening examinations using low-dose spiral computed tomography (LDCT) or to control group screened with annual chest x-rays. During a median follow-up interval of 5.5 years, there was a 20% reduction in the mortality rate from lung cancer with LDCT screening when compared to screening with annual chest x-rays.

This study provided evidence for the first time that lung cancer screening can shift the detection of lung cancer to earlier stages and that treatment of earlier-stage lung cancer can improve overall 5-year survival. This concept is a welcome finding for the millions of tobacco-exposed adults who have seen virtually no improvement in lung cancer survival rates in decades.

US Preventive Services Task Force Recommendations
Since the NLST results were released, a number of professional organizations have issued recommendations regarding lung cancer screening with LDCT (see table below). Most important among these, because of their influence of health insurance coverage, are recommendations from the US Preventive Services Task Force (USPSTF). The USPSTF issued a Grade B recommendation in support of LDCT screening for lung cancer. A Grade B recommendation means “there is moderate certainty that the net benefit is moderate to substantial.”

The specific recommendations from the USPSTF are for annual lung cancer screening with LDCT “in adults ages 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years”. Furthermore, they recommend, “screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery”.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Primary Screening Eligibility Criteria</th>
<th>Additional Screening Eligibility Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Preventive Services Task Force</td>
<td>≥ 30 pack-years*</td>
<td>Smoking Exposure Lower Age Upper Age</td>
</tr>
<tr>
<td>American Association of Thoracic Surgery</td>
<td>≥ 30 pack-years *</td>
<td>55 79</td>
</tr>
<tr>
<td>American Cancer Society</td>
<td>≥ 30 pack-years *</td>
<td>55 74</td>
</tr>
<tr>
<td>American College of Chest Physicians</td>
<td>≥ 30 pack-years *</td>
<td>55 74</td>
</tr>
<tr>
<td>American Lung Association</td>
<td>≥ 30 pack-years *</td>
<td>55 74</td>
</tr>
<tr>
<td>American Society for Clinical Oncology</td>
<td>≥ 30 pack-years *</td>
<td>55 74</td>
</tr>
<tr>
<td>American Thoracic Society</td>
<td>≥ 30 pack-years *</td>
<td>55 74 Lung cancer survivor No limit</td>
</tr>
<tr>
<td>International Association for the Study of Lung Cancer</td>
<td>≥ 30 pack-years *</td>
<td>55 80</td>
</tr>
<tr>
<td>National Comprehensive Cancer Network</td>
<td>≥ 30 pack-years *</td>
<td>50 79</td>
</tr>
</tbody>
</table>

* If patient currently smokes or quit smoking within the past 15 years
** If patient has high risk factors: strong family history of lung cancer, COPD with FEV1 <70%, prior lung cancer, and/or occupational or environmental exposures

TIPS for Lung Cancer Screening in Older Adults
- Consider ordering low-dose spiral computed tomography (LDCT) to screen for early lung cancer in patients 55-80 years old if they have a smoking history ≥ 30 pack-years and either currently smoke or quit within the past 15 years.
- Before ordering LDCT screening, assess whether the patient has health problems that might limit life expectancy, in which case screening may not be appropriate. Also discuss the potential benefits and harms of screening.
- Also assess whether the patient has the ability and willingness to undergo surgical treatment for lung cancer. If not, screening is not appropriate.
**ELDER CARE**

**Recommendations Not in Support of Screening**

In contrast to the 9 organizations listed in the table that recommend screening, the American Academy of Family Physicians (AAFP) concluded that there is insufficient evidence to recommend annual screening. AAFP points out that results of the 3-year NLST should not be generalized to annual screenings that could continue for decades. In addition, AAFP noted that screening is accompanied by a high false-positive rate, with many patients undergoing further evaluation.

Although a high false-positive rate is a concern, advocates of screening would counter that in the NLST study, the majority of patients with positive screens underwent additional clinical (72%) and imaging (81%) studies for false-positive nodules; only 10% had invasive procedures. And, of course, lung cancer is the greatest cause of cancer death in the US. A 20% reduction in 5 year mortality means that over 30,000 lives could be saved each year with appropriate screening, adding valuable years of life.

**Health System Considerations**

As the population ages, the number of current and former smokers who meet the age criteria for LDCT screening will increase, and screening according to current guidelines may strain health resources. This strain will be further increased if the upper limit for screening is raised as the health and functional status of older adult continues to improve, making it possible for them to safely undergo potentially curative lung cancer surgery at an older age.

One strategy under consideration is to focus efforts on screening patients at highest risk. As noted in the table, high-risk patients are those with a strong family history of lung cancer, COPD, and/or with occupational and environmental exposures that predispose to lung cancer.

Risk modeling has been used to examine how best to target LDCT lung cancer screening. One important risk-modeling study, which addresses the concern about high false-positive screening results, divided subjects from the NLST into quintiles of 5-year risk of death from lung cancer. Risk level was based on age, pack-years of smoking, chronic lung disease, years since quitting smoking for those no longer smoking, and family history of lung cancer. The study showed that individuals with multiple risk factors had the greatest reduction in lung cancer deaths as a result of LDCT screening. They also had a lower false-positive screening rate and fewer screenings needed to prevent lung cancer death.

**Individual Patient Considerations**

Lung cancer screening is only appropriate for patients who can tolerate cancer treatment. Thus, older adults must be evaluated on an individual basis to consider factors such as frailty, physiologic reserve, co-morbidities, and fitness level. (See Elder Care Disease Screening in Older Adults)

The good news, however, is that diagnostic testing and treatments for lung cancer have become safer, making them applicable to more and more patients. When performed by experienced teams, navigational bronchoscopies and CT-guided biopsies carry low rates of complications. Minimally invasive surgical procedures afford patients less pain and shorter hospital stays. Tailored chemotherapy and stereotactic body radiation therapy have resulted in fewer dose-limiting toxicities. But still, each patient should have a comprehensive evaluation before embarking on lung cancer screening and treatment.

**Final Comment**

The NLST has provided us with a great leap forward in the early detection of lung cancer and the subsequent prevention of lung cancer deaths. The Grade B recommendation from the USPSTF will soon make insurance coverage available for eligible patients in the US under guidelines of the Affordable Care Act. But, if efforts to detect and treat early-stage lung cancer are to succeed, it will be up to primary care clinicians and pulmonologists to implement appropriate screening for their older adults patients.

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**References and Resources**


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**ACOVE Quality Indicators**

If a vulnerable elder presents with onset or discovery of malignancy (excluding skin cancer), THEN the patient should be asked about or treated for depression, or referred to a mental health professional within 2 months of diagnosis of the condition.

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**Interprofessional Care Improves the Outcomes of Older Adults with Complex Health Problems**

Editors: Mindy Fain, MD; Jane Mohler, NP-c, MPH, PhD and Barry D. Weiss, MD

Interprofessional Associate Editors: Rosemary Browne, MD; Tracy Carroll, PT, CHT, MPH; Karen D’Yuyvetter, ND, MS; Colleen Keller, PhD, FNP; Teri Kennedy, PhD, LCSW, MSW; Jeannie Lee, PharmD, BCPS; Lisa O’Neill, MPH

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Supported by: Donald W. Reynolds Foundation, Arizona Geriatric Education Center and Arizona Center on Aging
Pain in Patients Who Have Heart Failure
Jennifer Gabbard, MD, College of Medicine, University of Arizona

Heart failure is a leading cause of hospitalization of older adults in the US. Clinicians providing care for patients who have heart failure typically focus on the patients’ cardiac symptoms, like dyspnea and edema. There are several studies, however, showing that up to 75% of patients with heart failure also experience pain, a symptom not typically assessed by the clinicians who care for them.

Regardless of the cause, presence of pain in a patient with heart failure is important. Pain has the potential to lead to worsen heart failure symptoms, reduce quality of life, and ultimately, cause poor patient outcomes.

Pathophysiology
As shown in the diagram below, pain in patients with heart failure is typically multifactorial in origin. Pain can be both acute and/or chronic.

Acute pain, regardless of the initial cause, has been shown to result in increased activation of the sympathetic nervous system. This increase in sympathetic activity leads to:

- Increased blood pressure and heart rate
- Increased workload on heart
- Increased O2 consumption
- Increased activity of renin-angiotensin system, cortisol levels, and antidiuretic hormone secretion, all leading to fluid retention
- Increased levels of substance P, histamine, prostaglandins, and bradykinin

The increased levels of these substances contribute to:
- Worsening heart failure symptoms
- Worse quality of life
- Worse prognosis

Contributing Factors
- Depression
- Immobility/deconditioning
- Medications
- Multiple comorbidities
- Loss of independence
- Social isolation
- Spiritual problems
- Loss of purpose

TIPS FOR DEALING WITH PAIN IN PATIENTS WHO HAVE HEART FAILURE
- Don’t forget to consider and evaluate pain in patients who have heart failure, as both acute and chronic pain can worsen heart failure symptoms if the pain is not controlled.
- When using analgesic medications to control pain, keep in mind that a number of medications should be avoided in patients who have heart failure. Notable among these are non-steroidal anti-inflammatory drugs, which cause fluid retention.
- Consider the approach of treating “total pain,” which emphasizes dealing not just with physical pain, but also the patient’s social, spiritual, and emotional needs.
to an increase in norepinephrine and epinephrine levels which, in turn, increase cardiac work and oxygen consumption. It also increases activation of the renin-angiotensin-aldosterone system, potentially leading to fluid retention and overload. The factors can combine to worsen heart failure symptoms.

**Chronic pain** also has an effect on heart failure, but the effect appears unrelated to sympathetic hyperactivity and its mechanism is less well understood. Some theorize that chronic pain is a “maladaptive” response involving inflammation, with sensitization and excitability of neurons. In support of these theories, inflammatory markers like C-reactive protein are often elevated in patients with heart failure, as are markers of neural excitability like substance P.

**Types of Pain**

Awareness of the nature of a patient’s pain may allow identification of a reversible condition or help better inform the approach to treatment. Somatic pain is typically aching and throbbing and often due to arthritis. Visceral pain is often experienced as pressure and associated with nausea, vomiting and diaphoresis. Neuropathic pain, which often feels like a shooting or electric sensation, is commonly seen in patients with diabetes.

**Treatment**

The first step in pain management is to determine the type and severity of pain. The table below provides some general guidance on the approach to treatment of different types of pain in patients with heart failure.

<table>
<thead>
<tr>
<th>Type of Pain</th>
<th>Treatment Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild pain</td>
<td>• Start with non-opioid analgesics like acetaminophen (limit acetaminophen to 3g a day)</td>
</tr>
<tr>
<td>Moderate pain</td>
<td>• Start with weak opioids such as tramadol or oxycodone/acetaminophen</td>
</tr>
<tr>
<td>Severe pain</td>
<td>• Strong and long-acting opioids (Note: methadone can prolong the QT interval)</td>
</tr>
<tr>
<td>Uncontrolled pain even with narcotics</td>
<td>• Nerve blocks, epidurals, neurolytic block therapy, spinal stimulators, and patient-controlled anesthesia pumps</td>
</tr>
<tr>
<td>Angina</td>
<td>• Standard therapy: beta blockers, nitrates, calcium channel blockers (Note: diltiazem calcium channel blockers can increase edema)</td>
</tr>
<tr>
<td></td>
<td>• Persistent angina: ranolazine, enhanced external counterpulsation therapy, transmyocardial laser revascularization therapy, thoracic epidural nerve blockade</td>
</tr>
<tr>
<td>Neuropathic pain</td>
<td>• Tricyclic antidepressants (can cause arrhythmias); steroids (can cause fluid retention); anticonvulsants</td>
</tr>
</tbody>
</table>

**References and Resources**


**ACOVE Quality Indicators**

1. All vulnerable elders should be screened for chronic pain during the initial evaluation period.
2. All vulnerable elders should be screened for chronic pain every 2 years.
3. If a vulnerable elder with chronic pain is treated with opioids, THEN he or she should be offered a bowel regimen, or the medical record should document the potential for constipation or explain why bowel treatment is not needed.

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**Interprofessional care improves the outcomes of older adults with complex health problems**

Editors: Rosemary Browne, MD; Mindy Pain, MD; and Barry D. Weiss, MD

Interprofessional Associate Editors: Tracy Carroll, PT, CHT, MPH; Karen D’Huyvetter, ND, MS; Colleen Keller, PhD, FNP; Teri Kennedy, PhD, LCSW, MSW; Jeannie Lee, PharmD, BCPS; Jane Mohler, NP, MPH; PhD; Lisa O’Neill, MPH

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Supported by: Donald W. Reynolds Foundation, Arizona Geriatric Education Center and Arizona Center on Aging
Physical Exercise Guidelines for Older Adults
Jorge C Mora, MD, MPH, Florida International University
Jerry Ciocon, MD, Florida International University, Doctors Plus Medical Center, Pembroke Pines, FL

Regular physical exercise is a key intervention in aging for preserving cognition, function and well-being, and for reducing the risk of cardiovascular events. Indeed, there is an inverse relationship between fitness and mortality in both healthy older individuals and in those with chronic diseases. Key benefits of physical exercise for older adults are shown in Table 1.

Although physical decline is often associated with aging and can affect almost all systems in the human body, the rate of decline varies considerably. There is evidence that this deterioration may be partially avoided and/or reversed with regular exercise and avoidance of sedentary lifestyles. In fact, older adults have the ability to respond positively to exercise even in their 90s.

Unfortunately, while there are clear benefits to physical exercise with aging, older adults are at higher risk than younger individuals for many sports-related injuries and the disability that results from them. Providing patients with guidelines may help to maximize the benefits of regular exercise while minimizing the risk of injury.

Exercise Recommendations for Older Adults
The American College of Sports Medicine and the American Heart Association (ACSM/AHA) guidelines state that to achieve health benefits, older adults should participate in at least 150 minutes/week of aerobic exercise (Table 2 on reverse side of page). The US Department of Health and Human Services (DHHS) has issued similar guidelines, but the DHHS guidelines stress that additional health benefits are attained if the amount of moderate and vigorous-intensity exercise is 300 minutes/week.

For older adults who are deconditioned, functionally limited, frail, or have chronic conditions that affect their ability to perform any physical activities, a more conservative exercise regimen is necessary to prevent complications or injuries. For example, short episodes of activity are appropriate for people who were inactive and have gradually started to increase their level of fitness. Balance training and/or muscle strengthening should precede any aerobic training in frail individuals.

<table>
<thead>
<tr>
<th>Table 1. Key Benefits of Physical Exercise in Older Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System</strong></td>
</tr>
<tr>
<td>Inflammation</td>
</tr>
<tr>
<td>Neurological</td>
</tr>
<tr>
<td>Cardiovascular</td>
</tr>
<tr>
<td>Endocrine and Metabolic</td>
</tr>
<tr>
<td>Muscles</td>
</tr>
<tr>
<td>Bones and Joints</td>
</tr>
<tr>
<td>Ligaments and Tendons</td>
</tr>
<tr>
<td>Pulmonary</td>
</tr>
</tbody>
</table>

**TIPS FOR RECOMMENDING EXERCISE REGIMENS FOR OLDER ADULTS**
- Older adults should remain physically active. The target for health benefits is at least 150 minutes of aerobic exercise per week. If this cannot be obtained, some exercise is better than none.
- For additional and more extensive health benefits, recommend 300 minutes per week of aerobic exercise.
- If a patient is sedentary, has multiple medical conditions, is frail, or has problems with balance, the patient should be enrolled in an observed physical therapy program to aid in beginning a physical activity regimen.
- Resistance (weight) and flexibility training should be part of the exercise routine for older adults.
Common Exercise-Related Injuries in Older Adults

Exercise-related injuries in older adults are often the result of irregular activity, or overuse with repetitive microtrauma to tissues. These injuries account for up to 70% of sports injuries in older adults, and they take longer to heal when compared to similar injuries in younger adults. Muscle strains are among the most frequent overuse injuries, largely due to the decreased flexibility of musculoskeletal units and higher prevalence of weakened muscles that occur in older adults. Tendinoses, such as rotator cuff tendinopathy, medial epicondylitis, and syndromes of the wrist tendons are also common among those who exercise. Other factors that contribute to overuse injuries are osteoarthritis in weight-bearing joints and hypovascularity of tendon units, particular in the rotator cuff.

Medications and Exercise

Many older adults take daily medications for treatment of chronic medical conditions, and some of these medications can impair exercise performance. For example, beta blockers can reduce exercise tolerance, producing early fatigue, a lower lactate threshold, increased predisposition to hyperthermia during exercise, and bronchospasm in some individuals. Diuretics can lead to urinary loss of potassium and magnesium, which increases the risk of muscle cramping, arrhythmias, and rhabdomyolysis, especially during warm weather. Statins may induce muscle weakness, increase self-reported fatigue, and alter energy metabolism during aerobic exercise. Metformin can increase heart rate and lactate concentrations during exercise. Quinolones and steroids increase the risk of tendinopathy and tendon ruptures.

Other Considerations

For individuals who have been sedentary, have multiple medical conditions, are frail, or have problems with balance, it is often useful to begin exercise activities in a supervised physical therapy program, or through a “Sit and Be Fit” or “Silver Sneakers” program. Patients with recent cardiac events or exacerbations of pulmonary disease should be considered for cardiac or pulmonary rehabilitation, respectively. But, even if the individual is unable to fully participate in these programs and achieve the exercise goals listed in Table 2, some exercise is better than none. The goal is to avoid inactivity.

Table 2. Exercise Recommendations for Older Adults from the American College of Sports Medicine and the American Heart Association

<table>
<thead>
<tr>
<th>Exercise Type</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endurance</td>
<td>150 min/week moderate-to-vigorous intensity exercise*</td>
</tr>
<tr>
<td></td>
<td>Type: Any modality that does not impose excessive orthopedic stress</td>
</tr>
<tr>
<td>Resistance</td>
<td>2 times/week moderate-to-vigorous intensity exercise*</td>
</tr>
<tr>
<td></td>
<td>Type: Progressive weight training program or weight bearing</td>
</tr>
<tr>
<td>Flexibility</td>
<td>2 times/week moderate intensity exercise*</td>
</tr>
<tr>
<td></td>
<td>Type: Any activities that maintain or increase flexibility using sustained stretches for each major muscle group</td>
</tr>
<tr>
<td>Balance</td>
<td>For frequent fallers, or for individuals with mobility problems</td>
</tr>
<tr>
<td></td>
<td>Type: Progressively difficult postures that gradually reduce the base of support, dynamic movements that perturb the center of gravity, and stressing postural muscle groups</td>
</tr>
</tbody>
</table>

* Relatively moderate-intensity activity is at a level of perceived effort of 5 or 6 on a scale of 0 to 10, where 0 is the effort of sitting, and 10 is maximal effort. Relatively vigorous-intensity activity is a 7 or 8 on this scale.

References and Resources


ACOVE Quality Indicators

- If a vulnerable elder demonstrates decreased balance or proprioception, or increased postural sway, THEN an appropriate exercise program should be offered and an evaluation for an assistive device performed
- If a vulnerable elder is found to have problems with gait, strength, or endurance, THEN an exercise program should be offered

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Supported by: Donald W. Reynolds Foundation, Arizona Geriatric Education Center and Arizona Center on Aging
Substance Abuse in Older Adults

Ole Thienhaus, MD, MBA, Department of Psychiatry, University of Arizona

Substance abuse is a major public health problem that is frequently overlooked in clinical settings, particularly when dealing with older adults. Indeed, from a historical point of view, substance abuse was often not considered to be a problem in older adults - but this assumption has never been accurate.

While substance abuse is less common among older adults than in younger age groups, alcohol use disorders affect a substantial number of elders: some 3% (507,000; 2010) of older men and nearly 1% (225,700; 2010) of older women. These numbers are of particular concern because older individuals are more susceptible to the toxic effects of alcohol and to the potential interactions between alcohol and the many prescription and non-prescription medications that are so widely used by older adults.

There is also evidence that illicit drug use by older adults is increasing as part of a cohort phenomenon related to the baby boom generation reaching retirement age. Abuse of legal prescription medications, including benzodiazepines, opioids, and others, is also a growing problem. Some segments of the geriatric population, such as veterans, have particularly high rates of substance abuse.

Detection

The key feature of substance use disorders is addiction, which means there is a loss of control over the intake of a substance. However, not all patients demonstrate addiction and there is a broad range of other sign and symptoms that may indicate a substance abuse problem (Table 1). Though most of these signs and symptoms are non-specific, if present in older individuals they warrant further investigation.

In most cases, this investigation requires specific inquiry by the clinician. Questions should include the nature and quantity of substances used, but be aware that the quantity of alcohol or other substances is sometimes less important than evidence that use continues in spite of adverse effects, or a desire to stop using the substance. Most often, such loss of control can be inferred when social deterioration or substance-induced health problems have failed to lead to abstinence (Table 1).

Another approach when there is suspicion of a substance abuse disorder is to administer a screening questionnaire. However, field-tested screening tools validated for use with older adults only exist for alcohol abuse (Table 2).

<table>
<thead>
<tr>
<th>Domain</th>
<th>Signs and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities of Daily Living</td>
<td>Incontinence, poor hygiene/nutrition</td>
</tr>
<tr>
<td>Executive Function</td>
<td>Decision-making problems, financial problems, legal problems</td>
</tr>
<tr>
<td>General Function</td>
<td>Bruises from falls, burns, sleep problems, tolerance to medication effects</td>
</tr>
<tr>
<td>Neuropsychiatric</td>
<td>Anxiety, depression, disorientation, dizziness, headaches, seizures, mood swings, memory loss, syncope</td>
</tr>
<tr>
<td>Social</td>
<td>Social isolation</td>
</tr>
</tbody>
</table>

Table 1. Non-Specific Warning Signs and Symptoms of a Substance Abuse Disorder

<table>
<thead>
<tr>
<th>Screening Tests for Older Adults</th>
</tr>
</thead>
</table>

TIPS for Dealing with Substance Abuse in Older Adults

- Don’t forget to consider substance abuse in older adults - especially when there are warning signs like problems with activities of daily living, executive function, or social interactions, or when injuries or neuropsychiatric symptoms occur.
- When patients are found to have substance abuse problems, consider treatment with brief office-based motivational interviewing or extended cognitive behavioral therapy.
- Avoid prescribing disulfiram to older adults due to potentially lethal effects if alcohol is also consumed. Anti-craving drugs (e.g., naltrexone or acamprosate) should be prescribed as part of a full substance abuse rehabilitation program.
- Withdrawal of an abused substance should take place slowly unless there are toxic effects, in which case withdrawal should occur more rapidly. However, when an older adult has been taking a substance of abuse at stable low doses over a period of years with no toxic effects, withdrawal may not be necessary.
With concern regarding acute intoxication, blood or breath analysis tests for alcohol and urine drug screening tests can also be used, keeping in mind that synthetic opioids (e.g., hydromorphone and fentanyl) are not detected with routine urine drug screens. Special testing (e.g., gas chromatography) is required for ascertainment of chronic abuse. Routine blood tests may detect elevated gamma glutamyl transferase (GGT) or red cell mean corpuscular volume (MCV).

**Treatment**

Substance use disorders require treatment for several reasons. Beyond the social deterioration and acute dysfunction (accidents, legal and financial problems) that may occur, chronic use is associated with accelerated cognitive and functional decline. Acute intoxication may result in criminal behavior and incarceration. Finally, substance use in older adults raises the risk of suicide, and older men have the highest suicide risk of all gender and age groups.

**Psychotherapy** can be used with patients of any age who have alcohol use disorders. Brief interventions such as motivational interviewing, provided in two 15-minute office visits with telephone follow-up, or even one single brief intervention session, can reduce alcohol use one year later. For older adults in particular, 12- and 16-week cognitive behavioral therapies, in groups or individually, have some effectiveness for alcohol-addicted individuals; this benefit can probably be extrapolated to other substance addictions. Alcoholics Anonymous and other 12-step programs have been notoriously difficult to assess for efficacy; studies have suggested mixed results, at best, for older adults with substance addictions.

**Pharmacotherapy** with disulfiram (Antabuse), the classic aversive agent for treatment of alcohol abuse disorders, is not recommended for older adults because the adverse effects of alcohol, when consumed while taking disulfiram, can be lethal in older individuals. Newer medications, such as naltrexone and acamprosate, which have an anti-craving effect, have not been extensively studied in older adults. There is no reason to suspect that they should not have the same modest benefits as they do in younger individuals.

These anti-craving medications are only effective, however, when used as part of a full alcohol rehabilitation program. Furthermore, patients must be carefully evaluated before prescribing these drugs, particularly acamprosate, which undergoes renal excretion and thus requires dose adjustment in the presence of impaired renal function; it is contraindicated in renal failure.

**Medication Withdrawal** When the substance abuse problem relates to a prescribed medication, the medication should be tapered and discontinued if side-effects cause serious dysfunction, or if the patient has developed tolerance that will predictably result in dose escalation and the possibility of toxicity and death. Generally, detoxification should be handled as a long term measure. A slow decrease in daily dosage is more likely to avoid development of craving and subsequent relapse and, therefore, is preferred to an accelerated schedule. Obviously, however, a slow decrease in dosage is not an option when toxicity is already present.

In older patients who are on prescribed medications without evidence of tolerance or toxicity, an argument can be made to leave well enough alone. For instance, an older patient who has been on a low-dose benzodiazepine for 15 years “to help with my nerves” has likely developed a psychological dependence, but also is unlikely to start escalating the dose. Because of the potential of drug-drug interactions down the line, a gradual weaning would be desirable. But it may also be reasonable to continue the medication at this low dose as a change in the regimen might cause major anxiety for the patient and/or a disruption of the patient-provider relationship.

**References and Resources**


Interprofessional Senior Mentor Program

The Interprofessional Senior Mentor Program (IPSMP) is offered to University of Arizona and Arizona State University health science students, and is designed to increase their exposure to healthy older adults by allowing them to get to know an older adult in a non-clinical environment. This out-of-classroom experience pairs each student with a socially and physically active 65+ year-old community-dwelling adult who will be their senior mentor for a semester. They meet 3-4 times for approximately 2-3 hours each visit. Each meeting has activities aimed to increase the student’s geriatric knowledge, reduce stereotypes about aging and add meaning to their geriatric curriculum content, thus improving the way future health professionals care for older adults. The students also participate in one Interprofessional Team Meeting for a case review. This relaxed and engaging roundtable discussion allows them to increase their knowledge of the roles and expertise of other health professionals and learn the importance of team health care. During the spring semester of 2014, our program brought together 34 mentor/student pairs in Tucson and 11 mentor/student pairs in Phoenix. We received glowing reviews from all parties and are continuing to expand this very successful program.
Arizona Geriatric Education Center

The Health Resources and Services Administration (HRSA), an agency of the US Department of Health and Human Services, funds Geriatric Education Centers (GEC) across the nation to provide interdisciplinary training of health professions faculty, students and practitioners in the diagnosis, treatment and prevention of disease, disability and other health problems of older adults. Due to our innovative programs, renowned interprofessional faculty and statewide partnerships we have successfully competed for a GEC in Arizona 4 times!!

The primary goal of our Arizona Geriatric Education Center (AzGEC) is to help build an expanded, diverse, and prepared interprofessional geriatric workforce in Arizona to meet the special healthcare needs of older adults, especially the frail. There is a great need for this project, as Arizona is rapidly growing, with growth especially pronounced among older adults in ethnic minority groups and those living in rural and underserved areas. Many of these elders have multiple complex health problems, and poor function and quality of life, and will use a disproportionate share of health care resources with high associated costs.

Our AzGEC is a statewide consortium, including the University of Arizona Health Sciences Center, Arizona State University, and the Southern Arizona VA Healthcare Center. Through these partnerships we provide interprofessional education and training for health science students, nurses, NPs, PAs, physicians, pharmacists, public health and social workers to ensure seniors in Arizona receive quality care across the continuum. We are integrally involved in geriatric education and training, clinical demonstration and care, community engagement, and aging policy. We are linked to the Administration on Aging, National Institute on Aging, Department of Veterans Affairs, and other Health Resources and Services Administration programs.

In 2012, our GEC was awarded Supplemental Funding to provide updated and evidence-based Alzheimer’s disease (AD) and related dementia content to educate and train healthcare providers. The goal of the supplemental grant was to improve detection and early intervention of AD; manage the disease in the context of comorbid conditions; refer patients to appropriate clinical trials; access community services; and ultimately improve care for patients living with dementia, and their families and caregivers. This included addressing the unique needs of underserved and special populations. We are ideally positioned to build, expand and disseminate effective Alzheimer’s educational materials and curricular programs. We are excited to use our infrastructure and long-term relationship with the Portal of On-line Geriatric Education (POGOe) to help prepare an interprofessional workforce. We urge you to view our website at http://www.aging.arizona.edu to learn more!
EDUCATIONAL PROGRAMS

Advances in Aging Lecture Series

3rd Friday of every month, 12:00pm – 1:00pm

Schedule and location may be viewed at: http://aging.arizona.edu/education_training

View live at: http://streaming.biocom.arizona.edu/home/
Past lectures archived at: http://streaming.biocom.arizona.edu/categories/?id=5

Contact (520) 626-5800 for more information

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4 Core Courses + 2 Electives or Internship

This non-academic program is designed to provide knowledge of aging issues for anyone working with older adults

Core Courses: The Aging Mind and Body
Society and Aging
Legal and Financial Issues of Aging
Navigating the Health Care System and Aging Network

Electives: Communicating Effectively with Older Adults
Social Engagement: Keeping Older Adults Connected
Healthy Aging

http://www.outreachcollege.arizona.edu/online

Contact (520) 626-5808 for more information
Research: Combining cutting-edge research through our biology of aging, clinical, epidemiologic, and health services programs, we bring the bench to the bedside and back again to improve the quality of life and functional longevity of older adults.

Of special note are our Immunobiology and GeriMetrics Programs: Immunobiology research explores age-related changes in inflammation, immunity, bone, muscle, and fat biology. GeriMetrics uses innovative bioengineering tools to address common geriatric conditions and syndromes including imbalance and falls, cognitive deficits, pressure ulcers, polypharmacy management, self-care deficits and frailty.

Education and Training: We provide training and continuing education in aging issues to health science students and working professionals across the state. Our Interprofessional Arizona Geriatric Education Center and Reynolds Program in Applied Geriatrics help to prepare our state’s workforce in caring for Arizona’s older adults.

Clinical Care: We connect older adults with geriatricians and palliative care specialists – providers who are trained to meet the specific needs of aging adults.
We've heard it from everyone. From doctors, from our employees, from you: It's time to make healthcare less about process and more about people. So let's do it.

**LET'S CLOSE THE GAP BETWEEN PEOPLE AND CARE.**

The Hartford Center of Gerontological Nursing Excellence

A primary mission of the Hartford Center of Gerontological Nursing Excellence at ASU is to increase the number of quality doctoral and post-doctoral level faculty who focus on the care of older adults to teach in academic nursing programs throughout Arizona and surrounding Southwestern states.

In support of this mission, the center offers pre-doctoral and post-doctoral opportunities with an emphasis on increasing nursing capacity in the area of aging through research, practice and education, and leadership.

**Scholarship goals and opportunities, include:**

- Teach in graduate and undergraduate academic nursing programs.
- Develop academic career goals and scholarships.
- Develop leadership skills and interprofessional partnerships in the care of older adults.

The center receives grant funding from The John A. Hartford Foundation to support graduate students in gerontological nursing. Financial support through scholarships may be available for one year with option for renewal.

**Learn more at nursingandhealth.asu.edu/hartford**

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CPSA manages the delivery of high-quality health care treatment for more than 50,000 people a year. Men, women, children and entire families living with mental health and substance use disorder challenges benefit from the support we provide. Since 1995 we’ve been the silent helper right here in Pima County.

Helping those who help. It’s what we do.