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Reducing Physical Restraints
Staffing Ratios in Nursing Homes

Elder Care Provider Sheets:

Anemia of Chronic Disease
Driving and the Older Adult

Hypothyroidism in the Very Old
Medication Induced Hypokalemia
22nd Annual Fall Symposium
Promoting Optimal Outcomes in Aging
Friday-Saturday, October 29-30, 2010
At the Crowne Plaza Phoenix (I-17 @ Peoria)

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- Promoting Optimal Health Outcomes with Advanced Care Planning
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- Update on the Management of Congestive Heart Failure
- PSA and Cancer of the Prostate
- Drug Issues in the Elderly
- New Tool in Osteoporosis: Using the FRAX Tool
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We Welcome Letters to the Editor
Letters must be submitted via email or in writing and include information on how to reach the writer. We reserve the right to edit for style, clarity and brevity. Send submission to: Letter to the Editor, Arizona Geriatrics Society, 5020 North 8th Place, Suite C, Phoenix, AZ 85014.

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From The Editors:

We are pleased to welcome our new associate editors: Jeannie Lee, PharmD, BCPS, University of Arizona College of Pharmacy; Colleen Keller, PhD, FNP, Arizona State University College of Nursing and Health Innovation; and Teri Kennedy, PhD, CISW, Arizona State University, College of Public Programs, School of Social Work. With their expertise and enthusiasm we are hoping to expand the interprofessional focus of the Arizona Geriatrics Society Journal and make it truly the voice of all health professionals in Arizona and beyond who are committed to improving the care of older adults.

In this issue we continue to feature our Elder Care Provider Sheets—practical, evidence based short guides for students and clinicians, funded by the Arizona Geriatric Education Center and by a grant from the Donald W. Reynolds Foundation. We have two clinical updates: one on HIV in older adults submitted by a team from St. Joseph’s Regional Medical Center in Paterson, NJ; and another, from the Arizona State University, College of Nursing and Health Innovation that describes a unique program teaching meditative movement to frail older adults to prevent functional decline. Our research article in this issue is a report of a retrospective study at the Southern Arizona VA Health Care System looking at patterns of warfarin use to prevent strokes in a population of older veterans with atrial fibrillation. Two articles in this volume address issues in long term care. One, submitted by the Nursing Home Project Team from Health Services Advisory Group, Inc. (HSAG), the Medicare Quality Improvement Organization (QIO) for Arizona, describes the successful implementation of a restraint reduction program across 11 Arizona nursing homes. The other, the Reynolds Question of the Month, explores the difficulties of identifying ideal staff: patient ratios in long-term care facilities. Finally, we are very happy to publish an all-too-rare letter to the editor. Rather than having the author(s) to whom the letter referred respond, we thought we could open up this controversial discussion of whether or not to use statins in older adults to all of our readers. Please send us your clinical experiences and opinions about using statins to treat older adults both with and without high lipid levels, for both primary and secondary prevention of cerebrovascular and cardiovascular disease.

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 practices, reviews 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 at least two members of the review board whose evaluations will provide a basis for the publication decision. We are committed to a rapid review process.

~Thank you

Mindy Fain, MD

Carol L. Howe, MD, MLS
To The Editor,

In the last issue of the Arizona Geriatric Society Journal (Vol 15, pages 1112 and 1124), it was suggested in two articles that statins should be used for primary prevention in older adults. This conclusion is far from clear and should be reconsidered.

A recent meta-analysis in the Archives of Internal Medicine found that statins in high risk primary prevention did not reduce all cause mortality in over 65,000 participants in 11 studies. This brings into the question the use of statins in anything but secondary prevention after myocardial infarction or established coronary artery disease. This is especially true of the elderly population. The Framingham Study showed that the cohort 80 years and older had better survival in individuals with elevated cholesterol. This relationship has been observed in other studies including the Hawaii Heart Study, The Fine Study, and a prospective study of Medicare recipients in Manhattan. Current guidelines for treatment of hyperlipidemia in older adults are based on extrapolation from secondary prevention to other high risk populations such as diabetics; 2/3 of people taking statins are taking them for high risk indications rather than secondary prevention. This has enormous implications regarding the cost of medications as well as potential serious side effect such as rhabdomyolysis.

A prospective study of the oldest old average age 89 followed for 10 years showed that the risk of death due to coronary artery disease was unrelated to serum cholesterol while the risk of death due to cancer and infection were lowest in individuals with the highest cholesterol, as was total mortality. This study suggests that a high cholesterol is not a risk factor for cardiovascular disease in the oldest old, and that an elevated cholesterol may actually have a protective effect in terms of risk of infection and cancer.

There is a question of whether lowering serum cholesterol may actually increase the risk of cancer. The Prosper study showed a decrease in cardiovascular events and cardiovascular mortality in 75 years olds followed for 3.2 years. There was no decrease in all cause mortality, and there was a statistically significant increase in the risk of developing cancer. Although this risk of cancer has not been observed in other studies, an analysis of multiple studies revealed that the degree of LDL-C lowering had shown an inverse relationship with the risk of developing cancer which was highly significant (p=.009). It is not clear what the relationship is between LDL-C lowering and the risk of cancer is but it is prudent to avoid treating for anything other than secondary prevention.

Other authors have concluded on the basis of pooled data that primary prevention is not beneficial in both men and women 69 years of age and older.

I have no conflict of interest.

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References


Editors Note:
Rather than having the authors of the articles referred to in this letter respond, we would like to open up a dialogue about this important topic. Please send us your clinical experiences and opinions about using statins to treat older adults both with and without high lipid levels, for both primary and secondary prevention of cerebrovascular and cardiovascular disease. (Send to: Mindy Fain, MD, Journal Editor at mfain@aging.arizona.edu)
Patterns of Anticoagulation by Primary Care Providers for Older Patients with Atrial Fibrillation

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Atrial fibrillation (AF) is the most common sustained cardiac rhythm disturbance in the adult population in this country.1 The prevalence of AF is 0.4% to 1% in the general population2,3 but increases with age, becoming as high as 9% in people older than 70 years of age.4 It is one of the most common causes of ischemic stroke.5,6 This stroke risk goes up with age, and atrial fibrillation is responsible for as many as 25% of strokes in individuals between the ages of 75 and 84 years.7 In a meta-analysis of 13 trials of thromboprophylaxis in AF, adjusted-dose warfarin significantly reduced the risk of ischemic stroke or systemic embolism compared with aspirin (ASA) or placebo.8 With warfarin therapy, the relative risk of stroke can be reduced by about 68%.9 This has led to the recommendation that warfarin be considered in patients over the age of 70 with AF.10

The American Heart Association (AHA), the American College of Cardiology (ACC) and the European Society of Cardiology (ESC) guidelines recommend anticoagulation with a vitamin K antagonist for patients with higher stroke risk based on risk stratification schemes using several established stroke risk factors.1 (see Table 1)

Despite conclusive evidence from randomized controlled clinical trials, the use of warfarin for the prevention of ischemic stroke in AF is suboptimal.11,12,13 Reasons for not anticoagulating are especially pertinent in the elderly and the question arises whether risks outweigh benefits. Studies have shown that only 15-44% of patients with atrial fibrillation are anticoagulated even where benefit from anticoagulation has been demonstrated. Additionally, the elderly are least likely to be anticoagulated, although their risk of stroke is much higher than in younger patients.14

Elderly patients tend to have a higher incidence of relative contraindications to anticoagulation, such as fall risk, decreased warfarin metabolism, and presence of other chronic illnesses.15 These factors have given many physicians pause, causing them to be hesitant to make the decision to anticoagulate and assume the responsibility to maintain a therapeutic INR range. Additionally, the hesitation to anticoagulate may be due to patient and provider preferences along with benefit-risk ratios as yet to be formally defined. This study seeks to define practice patterns of anticoagulation by providers for a population of older patients enrolled in Veterans’ Administration outpatient clinics. We sought to compare these provider patterns of anticoagulation with current guidelines.

Table 1: Indications for Warfarin in Af

- Prior thromboembolism (Stroke, Transient Ischemic Attack [TIA], or systemic embolism)
- Rheumatic Mitral Stenosis
- More than 1 moderate risk factor:
  - Age >/= 75 years old
  - Hypertension
  - Impaired LV systolic function (EF </= 35% or shortening fraction < 25%)
  - Diabetes Mellitus
- No contraindications formally defined
METHODS:
This study included patients who were enrolled or in the process of enrollment to the Home Based Primary Care (HBPC) Program (225 patients) at the Southern Arizona VA Health Care System (SAVAHCS) between the years 2000 to 2006. These patients were previously managed in the ambulatory primary care clinics at the SAVAHCS prior to their referral to the HBPC program for comprehensive home management of advancing chronic diseases. A total of 65 consecutive patients were identified with the diagnosis of atrial fibrillation or atrial flutter, as confirmed by firsthand review of electrocardiograms, echocardiography reports, and Holter monitor reports. This study plan was approved by the IRB of the University of Arizona. Information about each patient was accessed as part of the SAVAHCS’s electronic medical record. Comorbidities, including hypertension, diabetes, congestive heart failure, fall risk and history of stroke, were identified by review of problem lists, primary care notes, HBPC admission notes, neurology notes, and review of pertinent computed tomography or magnetic resonance imaging reports. As part of a comprehensive, multidisciplinary admission process to HBPC, medication lists were reviewed, and these notes were consulted to determine which patients were receiving any type of anticoagulation.

If patients were not on certain types of anticoagulation, primary care notes, HBPC notes, and cardiology notes were reviewed to determine reasons for not anticoagulating. Some patients had previously been anticoagulated, and the reasons for discontinuance were also noted. These reasons could be found in the previously mentioned notes, and in computerized pharmacy anticoagulation notes. For some patients, fall risk was specifically mentioned as a reason for not anticoagulating. For these patients, HBPC admission notes, primary care notes, computed tomography head scans, VA emergency department visits, and discharge summaries were reviewed for documentation of falls.

RESULTS:
This study included 65 patients with a median age of 82 years, with the following risk factors for stroke with AF: 77% (50 out of 65 patients) of the patients were age 75 years or older, 63.1% (41/65) of the patients had hypertension (HTN), 30.8% (20/65) had diabetes mellitus (DM), and 33.8% (22/65) had cardiac ejection fractions (EF) of ≤ 35% (see Figure 1). In our study, 35.4% (23/65) of patients had AF and a history of cerebrovascular accident (CVA), thus having indications for warfarin therapy. Of those patients without a history of CVA, 18.5% (12/65) had 1 risk factor, 30.8% (20/65) had 2 risk factors, 12.3% (8/65) had 3 risk factors, and 3.1% (2/65) had 4 risk factors (see Figure 2) for CVA.

Indications for ASA therapy
Per ACC/AHA/ESC guidelines, patients with 1 risk factor can be anticoagulated with either warfarin or ASA monotherapy. Of the twelve patients with 1 risk factor aside from CVA, 50% (6/12) were prescribed warfarin alone, 25% (3/12) were prescribed ASA monotherapy, 8.33% (1/12) were placed on both warfarin and ASA, and another 8.33% (1/12) were on both ASA and clopidogrel.

Indications for warfarin therapy
Among the patients with AF and history of CVA, 52.2% (12/23) were anticoagulated with warfarin. In the group of patients with 2 risk factors other than stroke history, 40% (6/20) of those patients were on warfarin therapy. For patients with 3 or 4 risk factors, 50% of each group (4/8 and 1/2 respectively) were prescribed warfarin. In our study, 53 patients had 2 or more risk factors, or a history of CVA, and therefore would be recommended to receive warfarin therapy. However, of this group, only 52.8% (28/53) were on warfarin, and 9.43% (5/53) were receiving no anticoagulation at all.
There were many reasons cited for not prescribing warfarin even when it was recommended. The most common reason for withholding warfarin therapy was fall risk at 39.3% (11/28) (Figure 3). In looking further, about 45.5% (5/11) of the patients deemed at risk for falls had not had a documented fall within the year prior to enrollment. Of the 54.5% (6/11) of patients who did have record of fall, none had suffered any serious or life-threatening bleeds from these falls. One patient had suffered a hemorrhagic stroke in the cerebellar region. Due to the gait problems that resulted afterwards, he was taken off of warfarin therapy. Per records, none of his documented falls had resulted in fractures or major bleeds. There were equal percentages at 7.14% (2/28) for reasons of limited life expectancy (due to age or other comorbidities) and alcohol abuse (which would complicate anticoagulation therapy). Some patients refused therapy although it might have been indicated. For 28 patients with a history of CVA and/or 2 or more risk factors, 21.4% (6/28 patients) refused therapy. Additionally, warfarin was held from 10.7% (3/28) of patients due to provider’s concerns about adherence. A large percentage of patients, 32.1% (9/28), had no reasons documented for not anticoagulating. Figure 3.

**Reasons Cited for Withholding Warfarin Anticoagulation**

- Short Life Expectancy
- Alcohol Dependence
- Adherence Issues
- Patient Refusal
- Fall Risk
- No Documented Reason

*Reasons cited for withholding warfarin anticoagulation in elderly patients with atrial fibrillation. Results were obtained by retrospective review of comprehensive electronic medical record. Among those patients cited as at risk for fall, approximately 50% showed no documented evidence of a fall in the prior 12 months.*

**DISCUSSION:**

The incidence of atrial fibrillation increases with age, and with our rapidly growing and aging society, the number of patients affected with atrial fibrillation is predicted to increase in the future. In prospective studies, the incidence of AF is 0.1% in patients younger than 40 years. This number, however, steadily increases with age, reaching 1.5-2% per year among people older than 80 years old. It has been estimated that in 2001 there were 2.3 million U.S. adults with atrial fibrillation. It is projected that by the year 2050, 5.6 million US adults will have atrial fibrillation.

Atrial fibrillation is a significant risk factor for ischemic stroke, accounting for approximately 15% of all strokes nationally. Among the elderly population, atrial fibrillation is responsible for as many as 25% of strokes in individuals between 75 and 84 years of age. Even in the absence of a clinically detectable stroke, AF has been implicated as a cause for impaired cognitive function in some individuals. It is thought that silent cerebral infarctions may contribute to this mental decline.

Based on consideration of 30 randomized trials, a recent study by Hart et al. showed that adjusted-dose warfarin remains the most efficacious prophylaxis against stroke for atrial fibrillation patients at moderate-to-high risk, and it reduces the risk of stroke by about 40% compared with antiplatelet agents. It is also recommended that factors such as age, comorbid conditions, medications including antibiotics and complementary and alternative products should all be considered when adjusting the dose of warfarin.

Currently ACC/AHA/ESC guidelines recommend anticoagulation with a vitamin K antagonist for patients with more than one moderate risk factor, including age 75 years or greater, hypertension, impaired LV systolic function (ejection fraction 35% or less or fractional shortening less than 25%), and diabetes mellitus. Anticoagulation is also recommended for patients with prior thromboembolism (stroke, transient ischemic attack [TIA], or systemic embolism) or rheumatic mitral stenosis, both of which which are associated with the highest risk for stroke in patients with AF.

Despite the presence of these guidelines, physicians are hesitant to prescribe anticoagulation, especially to elderly patients. Some studies have shown that even in the absence of obvious contraindications, patients are not anticoagulated. While elderly patients are at the highest risk of stroke due to AF, they also tend to have more complex health considerations, such as increased fall risk, decreased warfarin metabolism, and presence of other chronic severe illnesses. Also, should a bleeding event occur, there may be less physiologic reserve to support recovery from the acute insult, compared to younger patients. These factors have given many physicians pause in making the decision to anticoagulate. As a result, physicians must weigh out the potential benefits and risks of anticoagulation.

In the Euro Heart survey, age more than 75 years was a negative predictor for warfarin use in AF. In the Stockholm Cohort Study on Atrial Fibrillation, warfarin was prescribed at the time of hospital discharge for only 54% of patients with atrial fibrillation and no contraindication. There was a marked decrease in the use of warfarin among individuals >80 years. Another study of 21 teaching, 13 community, and 4 Veterans Administration hospitals showed that 54% of patients with AF and no contraindication got warfarin at the time of discharge. Age≥80 years was again a negative predictor of warfarin use.
In a recent survey, risk of falls has been shown to be the most common reason for providers to withhold anticoagulation in patients with atrial fibrillation. This concern may be overly cautious. Some authors suggest that a patient’s propensity to fall should not be a critical factor in deciding the choice of optimal therapy to prevent stroke in patients with atrial fibrillation, even though patients with fall risk have been reported to have an increased risk of intracranial hemorrhage. Despite this major adverse event, Gage et al. postulated that given the high incidence of stroke in patients with AF, this group of patients appeared to benefit from anticoagulant therapy if they had multiple risk factors for stroke. Other authors have also estimated that a patient must fall more than 295 times a year for risks to outweigh the benefits of anticoagulation. In our study, 81.5% of the population had a history of CVA or two or more risk factors for stroke. Per the ACC/AHA/ESC guidelines, warfarin for anticoagulation is recommended for stroke prevention in these patients. In our study population, 52.8% of patients with indications for warfarin were actually prescribed warfarin. For patients not anticoagulated with warfarin, fall risk was the most commonly cited reason among care providers. Despite the concern for fall risk, and the provider’s therapeutic decision not to anticoagulate, nearly half (45.5%) of the patients deemed at risk for falls had not had a documented fall within the year prior to enrollment. Additionally, of the patients who had evidence of a fall within the last year, none had suffered any serious or life-threatening bleeds from these falls. Other reasons cited for not anticoagulating patients with atrial fibrillation were life expectancy, alcohol abuse, and the patient’s refusal of such therapy. Our study was limited in that it was retrospective, nonrandomized, and a mostly male VA population. However, trends in withholding anticoagulation can still be identified from this study. Compared to current guidelines from ACC/AHA/ESC, anticoagulation may be suboptimal due to perceived risks in older patient populations. As mentioned above, one of the common barriers to anticoagulation in the elderly is concern about falls and fall risk. We recommend that risk of falls, and other reasons for not anticoagulating older patients with AF, should be carefully evaluated before withholding anticoagulant therapy in this age group. This study provides insights as to how perceived contraindications to anticoagulation may affect clinical practice and adherence to clinical practice guidelines. Since few studies exist regarding anticoagulation and AF management in the elderly, the information from this study can help to guide future geriatric cardiovascular research. Proposed directions include establishment of objective measures for risk assessment, creation of guidelines specific to elderly populations, and inclusion of more elderly patients in outcomes research regarding AF management.

References


One million people in the United States are believed to be infected with the Human immunodeficiency virus (HIV) that causes acquired immunodeficiency syndrome (AIDS). The Centers for Disease Control (CDC) estimates that 56,300 new HIV infections occurred in the United States in 2006. Patients older than 50 years contribute to 15% of new HIV/AIDS diagnoses, 24% of patients living with HIV/AIDS, and 35% of all AIDS deaths. The fact that the increase in the proportion of older HIV patients is expected to continue over the next decade, makes a case for scrutiny of the unique perspectives in management of HIV/AIDS in the elderly.

We present a case report of a 66 year old female presenting with nausea and vomiting, followed by a discussion of HIV disease in the elderly.

**Case Presentation**

A 66 year old Hispanic female presented to the Emergency Room with complaints of nausea, non-bloody vomiting and watery diarrhea for one week. She did not have history of sick contacts, recent travel, new medication or changes in her dietary habits, but did report a 30 pound weight loss over the last year associated with loss of appetite. She had been living in the U.S. for the past 20 years and denied smoking.

On examination, the patient appeared cachectic. She was fully oriented, hemodynamically stable, and weighed 88 pounds. There was no lymphadenopathy. Heart and lung examination showed no abnormalities. Breast exam was normal. The abdomen was soft and nondistended but mildly tender all over. Neurologic examination was unremarkable. Initial laboratory data showed a white blood cell count (WBC) count of 4700/µL (81% Polymorphonuclear cells, 9% Lymphocytes), Hemoglobin 12g/dL, Platelets 297,000/µL, Sodium 123 mEq/L, Potassium 2.8 mEq/L and Chloride 95 mEq/L. The rest of the metabolic profile, chest radiograph and 12 lead EKG were unremarkable. Stool studies were negative for ova, parasites, Clostridium difficile toxin, and stool leukocytes. CT scan of the head showed dilated ventricles. (See Image 1)

The presence of dilated ventricles raised the possibility of neurological involvement. The patient denied urinary incontinence, headaches, or visual symptoms, and did not have dementia or ataxia. MRI of the brain was ordered which showed diffuse meningeal enhancement. (Image 2)
Bedside lumbar puncture was performed. The results were as follows: Opening Pressure of 27 cm H2O, clear fluid, 9 WBCs, 0 RBCs, 91% lymphocytes, glucose 43mg/dl, protein 65mg/dl. Cytology was negative for tumor cells. Flow cytometry of the CSF sample showed inverted CD4+/CD8+ ratio. CSF cryptococcal antigen was positive with a titer > 1:256. Serum cryptococcal antigen was also positive with a titer of > 1:256. CSF culture later showed growth of Cryptococcus neoformans. The presence of chronic cryptococcal meningitis in this apparently low risk older woman raised the possibility of an immuno-suppressed state. A more detailed probe into the patient’s personal social history revealed interesting historical facts which were missed earlier. The patient had fled an abusive husband many years ago. While in the U.S.A, she had been sexually active with a man who had died eight years prior after suffering from a wasting disease associated with “purplish skin nodules.” The patient denied any blood product transfusion, intravenous drug use or sharing needles. HIV testing and counseling was offered and she agreed to be tested.

Rapid HIV-1 ELISA testing was positive, and was confirmed with Western Blot. The patient’s initial CD4+ count was 24 per µL and HIV-1 viral load was 260,000 copies per ml. Highly Active Anti Retroviral Therapy (HAART) was initiated. The patient gained 18 pounds over the next 3 weeks. After 6 months of therapy, her CD4+ count had increased to 89/µL.

**Discussion**

In 1981, Dr. Michael Gottlieb published a paper describing case reports of 5 young homosexual males presenting with Pneumocystis carinii pneumonia. The author suggested the possibility of a cellular-immune dysfunction that predisposed individuals to opportunistic infections. This landmark publication laid the foundations for recognition of an epidemic which would later be known as HIV/AIDS.

Before the advent of Highly Active Anti Retroviral Therapy (HAART), the mortality of HIV infection was nearly 100 percent. However, due to the potent virologic suppression achieved with antiretroviral drugs, HIV has become a treatable, and hence chronic, condition. The mean age of HIV patients is increasing. This trend can be attributed to late diagnosis of primary HIV infection, besides increased longevity.6

Older patients pose a unique therapeutic challenge in the management of HIV. Experts agree that there is relatively little data, especially controlled data from randomized trials, regarding efficacy and safety of treatment, drug interactions, and the effects of comorbid conditions.7,8 One of the key reasons for this is that advanced age is a key exclusion criterion for therapeutic drug trials. In addition, the results of the trials conducted on younger patients cannot always be extrapolated to older patients.

**Epidemiology**

“Elderly,” in the context of HIV, refers to patients aged more than 50 years as these patients differ significantly from younger (aged 18-49 years) patients with HIV. Older adults with HIV are more likely to be men, to have acquired the disease by sexual transmission, to have AIDS and to have comorbidities like cardiovascular disease and diabetes.9,10 The likelihood of more advanced disease in this population is increased because many older individuals are unaware of their HIV status and do not report positive for any risk factor for HIV.10 Lack of suspicion on the part of physicians; lack of awareness on the part of older patients as well as a sense of lack of vulnerability in this population; unsafe sex practices; confusion between comorbid conditions and AIDS-related illnesses; and less frequent screening are some of the plausible causes for late diagnosis.

**HIV and Aging: Common Threads?**

Aging in normal persons is associated with a decline in the availability of naive T-cells as well as impaired signal transduction and T-cell activation. Since T-cell dysfunction is also a hallmark of HIV infection, a possible synergistic effect between HIV and aging on immunologic deterioration has been investigated. Age has been shown to be an independent predictor of HIV progression.11 HIV infection accelerates aging by causing chronic persistent activation of HIV specific CD8+ clones, which is responsible for premature replicative senescence, a change similar to aging.12 Premature dysfunction of the immunologic system may be a key contributor in the pathogenesis of HIV infection and the resultant immunodeficiency.13 In the light of possible synergism between...
HIV infection and aging, it is not surprising that older individuals tend to have lower CD4+ counts and greater progression of disease.

**Does Age Affect Overall Prognosis and Response to HAART?**

Although there are some studies which show no difference in survival, or in virologic and immunological response, in younger and older HIV patients started on HAART, there is enough data to support the fact that HIV infection in the elderly takes a more aggressive course. The ART Cohort Collaboration was designed to predict prognosis in treatment-naive, HIV-1 infected patients starting HAART in North America and Europe. Data gathered over 24,310 person-years of follow up showed that advanced age, along with other factors such as a low CD4+ counts and high HIV viral load, were independent predictors of a poorer prognosis.

The COHERE study group, a multi-cohort collaboration of 33 European cohorts, concluded that older individuals have better virologic response (HIV RNA less than 50 copies/ml) in patients older than 50 but poorer immunological response (CD4+ increase of more than 100 cells/µL) in individuals older than 60. Grabber et al. in a prospective, multi-center cohort study, also showed slower CD4 reconstitution in the elderly despite a better virologic response. It would be reasonable to conclude that older patients have lower CD4+ counts at the beginning of treatment, a blunted immunologic response, faster progression to AIDS and lower overall survival.

**Is Viral Replication the Key? Evidence From the SMART Study.**

The data from the SMART study showed that uncontrolled viral replication, irrespective of the CD4+ counts, places patients at increased risk of complications. In 2008, the International AIDS Society-USA panel recommended initiation of therapy, independent of CD4+ cell counts, in conditions such as: high viral load (i.e., >100,000 copies/ml), rapid CD4+ cell count decline (>100/µL per year), and presence of risk factors for non-AIDS diseases, particularly cardiovascular diseases. Although there are no separate guidelines for the elderly, these recommendations assume far reaching significance given the fact that older patients with HIV are much more likely to have comorbid conditions than younger patients.

**HAART: The Other Side**

As a result of increased longevity in patients on HAART, non-AIDS conditions, age related comorbidities and drug toxicities have become important variables determining outcomes in HIV patients. Recent assessments of mortality trends confirm an increased proportion of deaths attributable to non-AIDS conditions in patients who are HIV positive.

HAART, particularly combination nucleoside-analogue and protease-inhibitor therapy, is believed to be responsible for a spectrum of metabolic changes which have been implicated in increasing the incidence of cardiovascular events, bone mineral disorders, and neurocognitive disorders in patients on HAART. In addition, the coexistence of cardiac, hepatic, and renal dysfunction increases the likelihood of adverse events such as drug toxicity and drug interactions. Since there is a paucity of controlled data on the efficacy and safety of HAART in this age group, therapy should be tailored to the unique requirements and limitations of individual patients. Specific considerations which may necessitate dosage adjustments and drug substitutions include: renal function, potential for hepatotoxicity, coexisting dementia, and interaction with other medications metabolized by the cytochrome P450 system. Since 95% adherence is needed to maintain virologic suppression, special consideration should be given to factors which may decrease adherence in the elderly. These include neurocognitive dysfunction, substance abuse, and high pill burden.

**Conclusion**

The HIV infected population is aging, and in the coming years, HIV/AIDS is poised to present as a chronic medical condition. Increased awareness among physicians, discussion with patients about high risk behaviors, and more frequent screening may help in the early diagnosis of HIV. Physicians are entrusted with the responsibility of striking a fine balance between cognitive function of the patient and complexity of the regimen, toxicity profile and efficacy of the therapy, an estimate of adherence and risk of drug resistance, and socio-economic-cultural background and support system of the elderly patients to determine the optimal regimen.

**References:**


A priority of older adults is to maintain good health and independence. Achieving both goals depends on maintaining physical function as well as a positive psychological attitude. Participating in regular physical activity that includes balance, flexibility, and strength training to build endurance is an appropriate strategy for sedentary older adults with chronic disease and functional limitations to enhance both physical function and psychological attitude.\(^1\) Achieving both goals depends on maintaining physical function and a positive psychological attitude in the population of the oldest-old.\(^2\) An interdisciplinary approach that impacts the mind, body, and spirit is well suited to improve physical function and psychological outcomes. Meditative Movement forms such as Tai Chi and Qigong have demonstrated improved physical function and psychological outcomes. Sign Chi Do is a novel mind-body-spiritual exercise that incorporates sign gestures, music, breathing, and spiritual meditation. This article will compare and contrast Sign Chi Do with Tai Chi and Qigong and discuss how Sign Chi Do works to improve physical function and balance.

Spiritual meditation emphasizes positive spirituality as opposed to negative consequences often associated with organized religious practice.\(^3\) Thus, spiritual meditation is a method of promoting gerotranscendence and positive psychological attitude for older adults.

The problem, then, is to employ interventions that address the mind-body-and spiritual components of older persons that are well suited to increase physical activity among sedentary older adults at risk for developing functional decline. Meditative movement blends physical movement or postures with a focus on the breath and mind to achieve deep states of relaxation.\(^4\) Modalities of meditative movement include yoga, Tai Chi, Qigong, and less familiar forms such as Sign Chi Do.\(^5\)\(^-\)\(^8\) Such forms of meditative movement are feasible, acceptable, and efficacious mode of physical activity for older, frail persons.

Sign Chi Do is a novel, low cost program that can be easily replicated in the community setting with the use of trained facilitators and a detailed implementation protocol. An in depth facilitator kit has been developed for use in the clinical setting. It is a DVD driven program. Included in this kit are instructional DVD’s (to play during the class), data disc (which includes all the handouts, pamphlets, sign in sheets and references needed for a class), music CD’s, a personal instructional DVD for the facilitator, an instructional manual and a complimentary membership for one year which makes new materials available to facilitators.

Recent research assesses the efficacy of Sign Chi Do in improving physical function in older adults.\(^9\) As a form of meditative movement, Sign Chi Do has unique characteristics that are believed to be particularly appropriate for sedentary older adults.
Sign Chi Do vs. Tai Chi

The efficacy of Sign Chi Do can be further assessed by comparing Sign Chi Do with Tai Chi and Qigong (hereafter referred to as Tai Chi). Sign Chi Do and Tai Chi are similar types of movement. Both forms employ slow, continuous movements of the arms and legs.\(^{14,18,19}\) Sign Chi Do and Tai Chi incorporate postural alignment, concentration, and weight shifting with a low center of gravity--purported to strengthen lower extremity and core muscles while improving balance.\(^{14,20}\) The upper arm movements are designed to strengthen the arm muscles and provide range of motion to improve flexibility. Both upper and lower extremity movements are designed to improve proprioception and muscle coordination. The differences between Tai Chi and Sign Chi Do include variation in the stepping method and on the focus used to achieve a meditative state. Tai Chi practice is generally performed with flat foot or heel-first stepping, while Sign Chi Do uses a toe first method to stabilize the movement and completion of the form. Some Tai Chi teaching encourages a focus on the flow of the movement and the rhythm of the breath to achieve a meditative state. Conversely, Sign Chi Do focuses on the meaning of positive word phrases of prayer with the intention of eliminating “chatter” in the brain.\(^{21}\) Sign Chi Do word phrases are taught in a three step pattern: do the movement (engaging the body), visualize what the phrase means (engaging the mind), and feel the word phrase (engaging the spirit). While the physical form of each word phrase is defined by the facilitator, each participant is encouraged to create his or her own visual representation and feeling of the word phrase. This is intended to promote the spiritual exploration. See Table 1 for a comparison of the two exercise forms.

Using Sign Chi Do Design To Improve Physical Function

Sign Chi Do has been used in research and detailed protocols are available to structure the Sign Chi Do intervention. The following outlines how the 12 week intervention can be implemented. One hour weekly sessions, spanning 12 weeks, include groups of 5-10 participants each. This small class size allows the facilitator to observe all participants and provide individual support during the class. According to Sign Chi Do protocol established by Borik, each session includes a 5 minute warm up and cool down time with 50 minutes for instruction and participation.\(^{21}\) Warm up movements consist of isotonic movements of arms and weight shifting stances of the legs (Table 2). Participants who are unable to stand are asked to perform movements from a seated position and visualize performance of the movements as if they were standing. For safety, all participants stand beside a chair to maintain stability.

Sign Chi Do word phrases are taught in a three step pattern: do the movement (practicing the physical form of the movement or sign gesture phrase), visualize what the phrase means, and feel the word phrase. The physical form of each movement is taught by the facilitator and demonstrated on the instructional DVD. Participants of Sign Chi Do are encouraged to create their own visual representation and feeling of the word phrase, intended to promote the spiritual exploration.

Weekly instruction includes 4 phrase-based routines during the first 6 weeks and more complex movements to familiar songs such as God Bless America, and Let There Be Peace on Earth for the next 4 weeks. All content is reviewed during the last 2 weeks. Participants are given a copy of an instructional DVD, music CD, flash cards, and a Personal Assessment Log to facilitate practice of movements at home, between classes. The flash cards can be placed on the floor or held in hand as a visual reminder for a word phrase and demonstration of the movement. In addition to the demonstration, word phrases are written on a grease board in the classroom for each class. Participants are encouraged to practice at least 10 minutes for two days between classes during the first week and to gradually increase the time to include up to the recommended 30 minutes five days of the week. They are asked to respond to reflective questions and record weekly practice in the Personal Assessment Log.

Table 1.

<table>
<thead>
<tr>
<th>Components</th>
<th>Sign Chi Do*</th>
<th>Tai Chi**</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI ENERGY</td>
<td>Mind and body connect with Chi energy flow. Three step pattern to engage the mind body and spirit: Do, Visualize, Feel</td>
<td>Mind and body connect with Chi energy flow.</td>
</tr>
<tr>
<td>MEDITATION EFFECT</td>
<td>Fills mind with positive word phrases.</td>
<td>Emptying the mind of distracting thoughts.</td>
</tr>
<tr>
<td>EXERCISE MOVEMENTS</td>
<td>Foot movement starts with toes first for stability.</td>
<td>Foot movement starts with heel first for balance control and flow of movement.</td>
</tr>
<tr>
<td>INSTRUCTOR</td>
<td>Facilitated class on DVD for teaching form and instructions on warm up, program content, and cool down. Can be learned in one session.</td>
<td>Takes 1-2 years to develop instructor.</td>
</tr>
</tbody>
</table>

\(^*^{Borik, 2006}; ^{**}^{Wolf, Coogler, & Xu, 1997, Jahnke, 2002}\)
Sign Chi Do Intervention

- Begin with warm up
- Initial form is taught from seated position, then standing. Participants are to stand beside their chairs for safety reasons. If needed, the chair is available for balance. Those who cannot stand are asked to contract leg muscles in place of stepping forward movement and relax when stepping back.
- Practice all movements on right first, then left to create balance
- Repetition of movements is key

<table>
<thead>
<tr>
<th>Warm-Up 5-10 minutes: All movements begin with Postural alignment (sitting or standing): Shoulders relaxed and in alignment with hips and feet and all facing forward. When standing, feet start shoulder width apart.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Begin with deep breath and raise arms in front of body, exhale as arms lower. Next breath, raise arms to side as inhale and lower as exhale.</td>
</tr>
<tr>
<td>Next do 5 forward and backward shoulder rolls followed by arm circles, front and back.</td>
</tr>
<tr>
<td>Place one hand on opposite shoulder. Raise elbow to shoulder height. Open opposite hand with palm facing ceiling and place under elbow. Lower elbow while giving resistance with hand under elbow. Inhale as you raise elbow and exhale as you lower with resistance. Repeat 5 times.</td>
</tr>
</tbody>
</table>

| Front leaning stance: Step forward one stride length, toes first and facing forward as knee bends. Maintain feet shoulders width apart. Opposite foot, toes slightly turned out (30°) and leg straight. Shift weight to back foot. Bend back knee and straighten front knee when shifting weight to back foot. Both feet remain flat on floor at all times. Connect breath and arms with leg movements (as weight shifts forward, raise arms and take in a deep breath, as shifting back, exhale). Repeat 5-10 times as able. As legs strengthen, may increase stepping distance. |
| L stance: Step back with one foot, making an L with feet (creating a 90° angle). Feet should be a comfortable distance apart and the heel of the back foot should land in line with front foot. Shift weight to back foot and front foot should be settled on heel with toes pointing up in the air. Most of weight on the back foot with knee bent and front knee is straight. Shift weight from back to front foot and bend front knee as back knee straightens. Connect breath and arms with leg movements (as weight shifts forward, raise arms and take in a deep breath, as shifting back, exhale). Repeat 5-10 times as able. |
| One Leg Stance: Plant one foot firmly on floor. Fix gaze on wall in front of you to assist with balance. Hold onto chair and raise opposite leg, making a 90° angle at knee. Hold as long as possible. Once conditioned to this movement, add by tucking foot behind knee of the supporting leg. Repeat 2-3 times initially and increase as able. |

| Example of one sign gesture movement: Physical form includes isometric and isotonic muscle contractions balanced with muscle relaxation. Practiced from seated position, then standing incorporating a modified front leaning stance. |
| Healthy: Bring hands to chest with palms open. Extend arms forward in a powerful manner with hands clenched into fist as muscles in forearm and upper arm tighten, assuming the boxers posture. Hold form for a count of 4 or follow timing of music. |
| Breath: Breathe in as hands placed on chest. Breathe out as arms extended. |
| Intention of word: Imagine strength or power emanating from your body. This move suggests that not only your body, but also mind and soul are healthy. Practice with music and repeat 3-4 times. |

| Learn movements with a 3 step process: |
| First learn physical form of the sign gesture, engaging the body. |
| Second, visualize what the phrase means (engaging the mind). |
| Third, feel the word phrase (engaging the emotional and spiritual exploration). |

| Meditative effects: |
| Intention of practice: set aside time to practice with purpose and thought. |
| Attention: feeling and visualizing the meaning of the word phrase. |
| Attitude: without judgment, but recognition of feelings experienced. |

| Spirituality / deep state of relaxation and overall well-being enhanced via: |
| Body movement or posture. |
| Focus on breath. |
| Clearing of the mind through the focus on meaning of the sign gesture. |

**Conclusion**

Sign Chi Do is an innovative strategy to improve physical function and promote positive spirituality in older adults and is particularly well suited for more frail adults as it can be conducted in the seated position. It is a form of meditative movement and has similar characteristics to Tai Chi that are believed to be essential to achieving similar outcomes. Future studies exploring the effectiveness of Sign Chi Do and mechanisms of change associated with improved physical function and spiritual well-being are recommended.

**References**


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Reducing Physical Restraints in Arizona Nursing Homes

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In this article, the Nursing Home Project Team from Health Services Advisory Group, Inc. (HSAG), the Medicare Quality Improvement Organization (QIO) for Arizona, discusses its collaboration approach to assisting 11 nursing homes targeted for improvement by the Centers for Medicare & Medicaid Services (CMS) and describes successful efforts these nursing homes made to safely decrease their use of physical restraints. Although not yet finalized/approved by CMS, preliminary evaluative data show that the nursing homes were able to collectively reduce their physical restraint use by a relative improvement rate of 84.7 percent without a statistically significant increase in resident falls and falls with fractures.

Background: The Medicare QIO Program

The Medicare Quality Improvement Organization (QIO) Program consists of a national network of 53 QIOs responsible for each state, territory, and the District of Columbia. QIOs work with health care providers, consumers, and stakeholders to ensure that care received by Medicare beneficiaries is effective, timely, patient-centered, and equitable.1 QIOs are private, mostly not-for-profit organizations that are staffed by professionals who are trained to review medical care, help Medicare beneficiaries with quality-of-care complaints, and assist health care providers to improve their care quality. QIO contracts are three years in length, with each 3-year cycle referenced as an ordinal Statement of Work (SOW).2

In August 2008, Health Services Advisory Group, Inc. (HSAG—the Medicare QIO for Arizona) began work on the 9SOW, which extends through July 2011. In the 9SOW, QIO work focuses on the priorities of beneficiary protection, patient safety, prevention, health disparities, chronic kidney disease, and care transitions. The patient safety component of the 9SOW—referred to as the National Patient Safety Initiative (NPSI)—is a focused effort designed to protect patients by implementing evidence-based practices to improve health care processes and systems. Since 2008, the NPSI has directly benefited over 120,000 patients through the hospitals and nursing homes that participate in QIO-led patient safety initiatives.3

This article specifically discusses 9SOW efforts related to improving the safety and care in nursing homes by decreasing physical restraint rates.

Restraints Defined

Awareness regarding physical restraint use in nursing homes has increased since the United States Congress passed the Omnibus Budget Reconciliation Act (OBRA) of 1987. That Act overhauled the way nursing homes are surveyed under Medicare/Medicaid Certification by creating a new set of comprehensive regulations, including detailed guidance on physical restraint utilization. Through OBRA, the Centers for Medicare & Medicaid Services (CMS) designated F-221 as the regulation for physical restraint utilization in nursing homes. F-221 defines a physical restraint as “any manual method or physical or mechanical device, material, or equipment attached or adjacent to the resident’s body that the individual cannot remove easily which restricts freedom of movement or normal access to one’s body” (42 CFR 483.13(a)).4 The intent of this regulation is for each person to attain and maintain his or her highest practicable well-being in an environment that prohibits the use of restraints for discipline or convenience and limits restraint use to circumstances in which the resident has medical symptoms that warrant the use of restraints. Table 1 lists some examples of restraints.

Table 1. F-221 Physical Restraint Examples*

<table>
<thead>
<tr>
<th>Example</th>
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<tbody>
<tr>
<td>Using side rails that keep a resident from voluntarily getting out of bed</td>
</tr>
<tr>
<td>Tucking in or using Velcro to hold a sheet, fabric, or clothing tightly so that a resident’s movement is restricted</td>
</tr>
<tr>
<td>Using devices in conjunction with a chair—such as trays, tables, bars, or belts—that the resident cannot remove easily, that prevent the resident from rising</td>
</tr>
<tr>
<td>Placing a resident in a chair that prevents the resident from rising</td>
</tr>
<tr>
<td>Placing a chair or bed so close to a wall that the wall prevents the resident from rising out of the chair or voluntarily getting out of bed</td>
</tr>
</tbody>
</table>

Physical Restraints in Nursing Homes

Research and standards of practice show that the belief that physical restraints ensure safety is often unfounded. In practice, restraints have many negative side effects and risks that, in some cases, far outweigh any possible benefit that can be derived from their use. Restraints not only may not prevent falls, they can cause great harm—including strangulation, loss of muscle tone, decreased bone density (with greater susceptibility for fractures), pressure sores, decreased mobility, depression, agitation, loss of dignity, incontinence, constipation, and, in some cases, resident death. Benefits of refraining from the use of physical restraints have been well-documented in long-term care literature: they include improvement in residents’ quality of life, greater autonomy, use of fewer anti-psychotic medications, less skin breakdown, and fewer serious injuries due to falls. Ongoing research has clearly demonstrated that physical restraints can be both physically and mentally damaging for residents, cost more in terms of resources, and can increase the incidence of serious injuries.

Direct factors influencing restraint use include trying to reduce falls and managing individuals with problematic behavior. Other, more indirect factors include resident mobility, alertness, consciousness, mental function, and behavior, as well as the fear of consequences for complications of falling or inability to address problematic behavior. Figure 1 shows 2008 and 2010 national and statewide physical restraint rates.7

A National List of Targeted-for-Improvement Nursing Homes

In February 2008, CMS published a national list of nursing homes targeted for high-risk pressure ulcer and/or physical restraint improvement. Nursing homes with a physical restraint rate greater than or equal to 11.00 percent during the selection period (Q4 2006 to Q2 2007) were placed on this list and designated as targeted-for-improvement nursing homes. (Restraint rates are derived from resident assessment data—the Minimum Data Set, or MDS—each nursing home is required to submit to the state survey agency on a prescribed schedule for each resident.) QIOs—under their CMS 9SOW contracts—were directed to successfully recruit nursing homes on this list from their respective states and work with them to collectively reduce physical restraint utilization by 20 percent relative improvement.

Working to Reduce Physical Restraints—An IHI Collaborative Approach

To achieve the relative improvement rate goal for physical restraint reduction, HSAG implemented an Institute for Healthcare Improvement (IHI) Collaborative-like approach with the 11 targeted-for-improvement Arizona nursing homes recruited from the CMS list and formed the HSAG Physical Restraints Collaborative in September 2008. The IHI Collaborative Model,8 is a short-term (6- to 15-month) learning system that brings together teams from health care settings to seek improvement in a focused topic area. The learning system encompasses a series of face-to-face learning sessions with action periods between each session that focus on rapid-cycle quality improvement, followed by a summative outcomes congress. The HSAG Physical Restraints Collaborative aligned with the CMS 9SOW to address areas of patient harm—in this case, physical restraint utilization—for which there is evidence of how to improve safety by improving health care processes and systems. A main objective of the Collaborative was to bring forward several components from previous CMS quality improvement initiatives, allowing participants to build on progress made in physical restraint reduction with other providers nationwide.

The HSAG Physical Restraints Collaborative

HSAG launched its Physical Restraints Collaborative after carefully identifying target audiences, participant training needs, the most advantageous training location, and optimal training modalities. HSAG chose training modalities that had been successful in face-to-face learning sessions and on-site visits with these types of nursing home facilities. Target audiences included the facility administrators, directors of nursing, MDS coordinators, and direct-care staff. These disciplines were selected as target audiences because of their strong influence in designing and facilitating care processes, as well as their ability to ensure proper documentation of device/restraint utilization. HSAG’s Phoenix office was chosen as the learning session venue due to its central location in proximity to the Collaborative participating nursing homes.

From September 2008 through March 2010, HSAG conducted five Collaborative learning sessions and one Collaborative teleconference. An Outcomes Congress is scheduled for early 2011. Between these sessions, HSAG staff members conducted follow-up site visits and teleconferences to provide consultation and technical assistance and to monitor participants’ progress on managing the changes necessary to implement the practices and materials presented in the trainings. These visits constituted the action periods of rapid-cycle quality improvement following a summative outcomes congress. The HSAG Physical Restraints Collaborative aligned with the CMS 9SOW to address areas of patient harm—in this case, physical restraint utilization—for which there is evidence of how to improve safety by improving health care processes and systems. A main objective of the Collaborative was to bring forward several components from previous CMS quality improvement initiatives, allowing participants to build on progress made in physical restraint reduction with other providers nationwide.

Initial Collaborative learning sessions provided toolkits and resources to educate attendees on CMS regulations, the physical restraint definition, daily processes of care for physical restraint reduction and management, and physical restraint alternatives and systematic reduction. These early sessions also ensured that participants understood how the physical
restraint quality measure was calculated from MDS resident assessment data. Information gathered from these early sessions indicated that not all nursing home staff members had a complete understanding of the physical restraint definition, and it was thus inconsistently applied. In-depth discussions on scenarios of physical restraint utilization allowed participants to come to a consistent understanding and definition of physical restraints. Moreover, nursing home staff often did not consider the effect of the devices based on the individuals’ physical functionality. Using the now understood definition of a physical restraint, Collaborative participants discussed real-life situations/examples to further understand the effects that physical restraints have on nursing home residents.

Examples:
1. Some staff members were inclined to code a specialized wheelchair with a seat belt for a quadriplegic resident as a restraint, even though the seat belt was for positioning only. The seat belt, in this scenario, did not restrict the resident’s movement or access to one’s own body due to the resident’s inability to move his/her upper and lower extremities.
2. As a safety reminder, some residents use a Velcro seatbelt on their wheelchairs that they can easily and consistently remove when asked by staff or inspectors. This, for definition purposes, is a device rather than a physical restraint according to the CMS F-221 regulation. However, facility staff members were also inclined to classify this example as a physical restraint.
3. Some staff members did not code a low bed from which a resident was unable to rise as a physical restraint, even though it prevented the resident from rising.

Subsequent Collaborative learning sessions and on-site visits focused on falls management programs, the use of restraint alternatives, and behavior management of cognitively impaired residents with poor safety awareness. In addition, Collaborative participants were provided with tools designed to help nursing homes implement daily processes of care for physical restraint reduction and management.

Collaborative participants also took part in the Agency for Healthcare Research and Quality (AHRQ) Nursing Home Survey on Patient Safety. The survey is designed to assess patient safety culture in nursing homes, raise staff awareness about patient safety issues, evaluate the impact of patient safety improvement initiatives, and track changes in patient safety culture over time. Additionally, Collaborative participants will participate in a remeasurement of the AHRQ survey so that HSAG can compare baseline survey results to remeasurement results as a means of evaluating the effectiveness of the Collaborative.

Restraint Alternatives and Systematic Reduction

As mentioned above, participants learned the concepts of restraint alternatives and systematic reduction while participating in the Collaborative. These concepts are to be integrated into the care planning process as nursing home care teams identify and treat resident health, functional, and psychosocial problems.

Some general principles of the restraint alternative concept involve playing to a resident’s strengths/likes, encouraging independence, involving a resident’s family, and offering a resident choices. The medical and behavioral conditions of a resident need to be carefully evaluated so that least-restrictive therapeutic, environmental, and equipment interventions can be put into place. Examples of some restraint alternatives for specific medical and behavioral conditions are provided in Table 2.

<table>
<thead>
<tr>
<th>Restraint Alternatives for Specific Behaviors</th>
<th>Residents who are verbally abusive and demonstrate poor safety awareness</th>
<th>Residents who wander and have cognitive impairment issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluating the resident for pain using the PAIN in Advanced Dementia (PAINAD) Scale</td>
<td>Utilizing diversion-type activities that correspond with past lifestyles/preferences</td>
<td></td>
</tr>
<tr>
<td>Assessing the resident for other physical needs such as hunger, thirst, position changes, and bowel and bladder urges</td>
<td>Considering how medications, diagnosis, activities of daily living, schedule, weather, or other residents affect or relate to wandering</td>
<td></td>
</tr>
<tr>
<td>Developing resident trust by assigning consistent caregivers whenever possible</td>
<td>Creating theme/memory/reminiscence boxes</td>
<td></td>
</tr>
<tr>
<td>Reducing external facility stimuli (overhead paging, TV, radio noise)</td>
<td>Identifying a resident’s customary routines and allowing for preferences</td>
<td></td>
</tr>
<tr>
<td>Teaching/implementing relaxation techniques (tapes, videos, music)</td>
<td>Assessing a resident’s personal agenda and validating behaviors</td>
<td></td>
</tr>
</tbody>
</table>

Discussing possible restraint alternatives was particularly helpful during on-site visits and when attending restraint/falls management weekly meetings at participating nursing homes. These discussions often sparked fresh and innovative ideas for implementing falls management programs for their identified resident populations. Consistent implementation of restraint alternatives into daily care processes also allowed these nursing homes to move toward a restraint-free environment while ensuring their residents’ safety and well-being.

With regard to systematic reduction as a means of creating a restraint-free, safe environment for residents, the F-221 regulation states, “As with other restraints, for residents who are restrained by side rails, it is expected that the process facilities employ to reduce the use of side rails as restraints is systematic and gradual to ensure the resident’s safety while treating the resident’s medical symptom”.

Examples of systematic and gradual physical restraints reduction include:
- Providing therapy or restorative care to enhance bed mobility, ambulation, transfers, and gait control.
- Placing the bed lower to the floor with a protective mat beside the bed.
- Providing frequent monitoring by staff with periodic assisted toileting for residents who attempt to arise to use the bathroom.

Through the process of systematic and gradual reduction of physical restraints, Collaborative nursing home staff members and residents began.
to experience confidence that physical restraints can indeed be reduced, and often eliminated, without an increase in resident falls and also falls with fractures.

**Derailing the Myths**

Although many of the Collaborative nursing homes were experiencing significant success with restraint reduction, there were still some nursing homes that were very cautious in starting their journey to untie the elderly. This was due to misperceptions and beliefs in long-standing myths—by residents, family members, and even nursing home staff members—that proved to be significant barriers to physical restraint reduction. HSAG’s experience providing technical assistance in past SOWs validated that these myths were alive and widely believed among nursing home residents, family members, and staff members. These myths included:

- **Myth:** Restraints prevent falls and injuries.
  **Fact:** Restraints are often actually the cause of injuries or even death.

- **Myth:** It is a nursing home’s moral responsibility to safeguard people by using restraints.
  **Fact:** Nursing homes are responsible for caring for people and helping them stay as healthy and happy as possible. Restraints usually do not help reach those goals.

- **Myth:** Residents do not mind being restrained. It makes them feel secure.
  **Fact:** No one likes to feel helpless or trapped. A restraint can cause residents to become depressed, confused, agitated, angry, or withdrawn.

- **Myth:** There are not any other options to protect my loved one.
  **Fact:** This may be true in a very few cases, but most nursing home residents can be safely cared for without using restraints.

- **Myth:** As a Power of Attorney (POA), I can ask a nursing home to use restraints on my loved one.
  **Fact:** Only a physician can order a restraint for a patient. Staff members may not use restraints when they are not medically needed, even if the resident’s family members request or approve their use. A restraint is like any other medical treatment: you need to know what medical symptoms are being treated. If there is not a medical reason for the restraint, it should not be used.

In an effort to quell these myths and decrease the pro-restraint support exhibited by some nursing home resident family members, Collaborative participants were introduced to the concept of “Making the Right Choice” during HSAG’s on-site visits. **Making the Right Choice: What You Need to Know About Restraints in Nursing Homes”** is a short informational brochure that educates hospital staff about nursing home regulations regarding restraint utilization, family members about the dangers of restraint use, and nursing home staff regarding the concept that physical restraints are not a means to prevent falls—that they can sometimes cause greater harm and injuries than the falls they are intended to prevent. HSAG recommended that this tool be provided to prospective residents and their family members not at the time of admission, but rather at the time of initial inquiry. Additionally, Collaborative nursing home staff members were advised to communicate with primary referral sources to explain nursing home regulations and potential dangers pertaining to physical restraint utilization. **Making the Right Choice** was found to be an excellent vehicle for communicating nursing home regulations to acute care staff members and resident family members.

**Collaborative Outcomes**

From the onset of the HSAG Physical Restraints Collaborative, the primary goal was to achieve at least 20 percent average relative improvement in the physical restraint quality measure within the 11 CMS targeted-for-improvement Arizona nursing homes. Secondary goals of the Collaborative were to ensure that resident falls and falls with fractures did not increase and to derail the commonly held myths involving physical restraint reduction.

Based on the Certification and Survey Provider Enhanced Reporting (CASPER) QI/QM Report (CASPER is a software program that houses MDS data and provides reports on that data) from the Baseline Period (Q1–Q2, 2008) to the Remeasurement Period (Q1–Q2, 2010), preliminary evaluative data—although not yet finalized/approved by CMS—show that physical restraint utilization decreased from an absolute rate of 9.01 percent to 1.38 percent (a statistically significant difference at the p = 0.01 level). This represents an average relative improvement of 84.7 percent. Given the change in rates from baseline to remeasurement, approximately 146 nursing home residents were freed from physical restraints in Arizona nursing homes because of the implementation of this project. Not only was the primary goal of 20 percent relative improvement in restraint rates met, the secondary goals were achieved as well. The statistically significant improvement in restraint rates was achieved without an accompanying increase in resident falls and falls with fracture(s). See Figure 2 for more detail.

To date, more than half of the targeted-for-improvement nursing homes are restraint free. Three of the nursing homes each have one physically restrained resident and continue to work toward a restraint-free environment.
Conclusions and Implications

Based on the reported outcomes of the HSAG Physical Restraints Collaborative, the work accomplished by the 11 targeted-for-improvement nursing homes demonstrates that statistically significant physical restraint reduction can take place without increasing resident falls or falls with fractures. By reducing—and often eliminating—physical restraint use, nursing home residents can enjoy a heightened quality of care and quality of life, while reducing the prospect of serious injury.

The statistically significant reduction of physical restraint use in these targeted-for-improvement nursing homes is attributed to the following interventions:

- Educating Collaborative participants on how to implement the correct CMS definition of a nursing home physical restraint (regulation F-221).
- Working with Collaborative nursing home staff members on effective alternatives to physical restraint use.
- Utilizing the practice of systematic reduction of physical restraints.
- Derailing myths of physical restraint reduction and "Making the Right Choice."

References


Acknowledgments:

Special thanks to Kathleen Bailey, PhD, LMSW, Quality Improvement Specialist; Elaine Nelson, RN, Clinical Quality Specialist; and Debra Stirnman, LPN, Clinical Quality Specialist, for their efforts on this project.
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Staffing Ratios in Nursing Homes

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Is there evidence for an “optimal” staffing ratio in nursing home settings and do staffing ratios have a meaningful relationship to measures of quality care in long term care? (Questions submitted by Paul Mulhausen, MD, Clinical Professor, General Internal Medicine, University of Iowa Carver College of Medicine, Iowa City Iowa) with response posted to the Portal of Geriatric Online Education [http://www.pogoe.org] on August 11, 2009.

The Phase II study conducted by Abt Associates, Inc. for the Centers for Medicare and Medicaid Services (CMS) in 2001 addressed the questions: “Is there some ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality problems? Conversely, is there some ratio of nurses to residents above which no additional improvements in quality are observed?”1(p.4) The researchers were indeed able to define appropriate threshold levels—namely “between 2.4 - 2.8, 1.15 - 1.30, and 0.55 - 0.75 hrs/resident day for nurse aides, licensed staff (RNs and LPNs combined), and Registered Nurses, respectively,”1(p.5) depending on nursing home population. These numbers seem to indicate the upper threshold of staffing above which little benefit accrues from adding more staff. As quoted in the subsequent literature addressing this topic, however, these ratios are more often than not used synonymously with minimal levels below which patients are at much greater risk for suffering adverse events.

Studies conducted since the 2001 Abt/CMS study have tried to improve methodologies and to expand the universe of long term care populations studied. No radically different recommendations for staff ratios have emerged. What has emerged, however, is an emphasis on analyzing the greater whole which comprises nursing home care rather than focusing on the single variable of staff ratio. Factors such as organizational structure of long term care facilities, their staff mix, staff stability and consistency of care all play crucial parts in determining quality of care—which itself is a complex and difficult attribute to measure. The need for ongoing research and attention is stressed throughout the literature.

At the Federal Level:

There has been considerable ongoing debate in the literature regarding optimal staffing ratios in long term care facilities. Minimum staffing requirements are spelled out in the federal Nursing Home Reform Act (NHRA), as part of the Omnibus budget Reconciliation ACT (OBRA) of 1987. As summarized by Zhang et al., the Act:

requires minimum staffing levels for registered nurses (RNs) and licensed practical nurses (LPNs), and a minimum educational training for nurse’s aides (NAs). The NHRA requires Medicare and Medicaid certified nursing homes to have: an RN director of nursing (DON); an RN on duty at least 8 hours a day, 7 days a week; a licensed nurse (RN or LPN) on duty the rest of the time; and a minimum of 75 hours of training for nurse’s aides. The law allows the DONs to also serve in the capacity as the RN on duty in facilities with less than 60 residents. In addition, the law requires nursing homes “to provide sufficient staff and services to attain or maintain the highest possible level of physical, mental, and psychosocial well-being of each resident” (Harrington, 2001; OBRA, 1987). Total licensed nursing requirements converted to hours per resident day (HPRD) in a facility with 100 residents are around 0.30 HPRD (Harrington & Millman, 2001), or 30 hours per day.2

It is generally agreed that these requirements are vague and insufficient. In 2000, Abt Associates Inc. conducted a Phase I study for the Centers for Medicare and Medicaid Services (CMS) which specifically examined the appropriateness of minimum nurse staffing ratios in nursing homes. Although the Phase I study found a definite relationship between staffing levels and quality of care, and did specify thresholds below which residents became at risk for harm, the study was generally found to be seriously flawed. The researchers apparently used data from only three states and that data was found to be inconsistent and inaccurate.3 APhase II study was published in 2001 which was methodologically stronger. The researchers looked at data from 10 states and over 5,000 facilities. They divided quality measures by short and long term stays. For short term stays, they looked at hospital transfer for conditions that could have been avoided—such as UTIs, sepsis and electrolyte disorders; for long term stays of at least 90 days, they looked at functional improvement, incidence of pressure sores, skin trauma, resisting care improvement and weight loss. Their findings were:

For each measure, there was a pattern of incremental benefits of increased nurse staffing until a threshold was reached at which point there were no further benefits with respect to quality when additional staff were utilized. Depending on the nursing home population, these thresholds range between 2.4 - 2.8, 1.15 - 1.30, and 0.55 - 0.75 hrs/resident day for nurse aides, licensed staff (RNs and LPNs combined), and Registered Nurses, respectively. Although no quality improvements are observed for staffing levels above these thresholds, quality is improved with incremental increases in staffing up to these thresholds [authors’emphasis].

Implementation of these thresholds as requirements would find 97 percent of all nursing homes failing to meet one or more of these standards [this writer’s emphasis]. The analysis also indicated that implementation of thresholds lower than those above which maximize quality, would still result in substantial improvements in a smaller, yet substantial portion of all nursing homes.1(p.5)

The bottom line, as recommended by the Abt study was that “a minimum of 4.1 HPRD [hours per resident day] was needed to prevent harm to residents with long stays (90 days or more) in
Gerontological Nursing.4,7 published in the February and March 2005 issues of the Journal of summary articles addressing state recommendations which were than the federal ones. Harrington has written two comprehensive states but in general the state recommendations specify lower ratios on duty at all times and staffing levels that increase as the number of patients increases. ”

The IOM report did support the 4.1 total nursing HPRD recommendation suggested in the initial Abt /CMS report.

Prior to the Abt/CMS and the IOM reports, recommendations had also been published based on an expert panel which was convened at the John A. Hartford Institute for Geriatric Nursing, division of Nursing, at New York University in April 1998.5

In addition to the RN DON, the panel recommended a full-time assistant DON for nursing homes with more than 100 beds, at least one RN nursing supervisor on duty at all times, and one full-time RN director of in-service education in nursing homes with more than 100 beds. The experts recommended a ratio of 1 direct caregiver (including RNs, LPN/LVNs, and NAs) to 5 residents on the day shift, 1 to 10 for evenings, and 1 to 15 for nights (2.93 HPRD). Finally the panel recommended nurse staffing levels be adjusted upward for residents with higher nursing care needs. Overall, the experts recommended a minimum of 4.44 HPRD of total nursing time (excluding DON and assistant DON of .11 HPRD) (Harrington, Kovner et al., 2000).6,7

Controversy over federal standards continues. Consensus may partially be hampered, as Harrington suggests by financial considerations. (“The debate over the federal standards has intensified and involves complex issues about funding new staffing requirements because government pays for 61% of total nursing facility costs in the United States (Levit, Smith, Cowan, Lazenby, & Martin, 2002).” (p.10) Another contributing complicating factor mentioned by many authors is the nursing shortage in the United States.4,5,6

At the State Level:

In addition to federal recommendations/requirements, almost all states have their own staffing regulations. These vary widely across states but in general the state recommendations specify lower ratios than the federal ones. Harrington has written two comprehensive summary articles addressing state recommendations which were published in the February and March 2005 issues of the Journal of Gerontological Nursing.4,7 The first article describes nurse staffing standards in all states and the District of Columbia. The second compares state minimum standards with actual staffing levels. For total nursing staff (RNs, LPNs, LVNs, and NAs) those state minimum standards range from a low of 1.02 hprd (DC) to 3.48 hprd (CA).

Comparing states’ minimum nursing standards is not an easy task. Tilly et al., for example,

found, as did Charlene Harrington, that state ratios vary in how they are described and are difficult to compare across states. For example, ratios vary by facility size or type, personnel, and shift; some are expressed as ratios to residents or to beds while others are expressed in hours. We found inconsistencies in the reporting of state ratios among different sources that might be caused by this variation and complexity; alternatively, the inconsistencies by be due to the timing of the various studies…

The difficulties found by Tilly et al. in comparing states’ existing minimum standards are just a fraction of those encountered by this writer in trying to interpret recent research addressing Dr. Mulhausen’s question, namely—is there evidence based research that would spell out an “optimal” staffing ratio for nursing home settings and the relationship staffing ratios have to measures of quality care.

What are we measuring, how do we measure it how do we know which is better?

Outlined below are some of the layers of complexity which exist:

1) The ratio itself. Three types are commonly referred to: hours per resident day (hprd); staff-to residents; and staff to beds.3 Hours per resident day seems to be the most widely used in the current literature. In large part this has evolved to avoid problems caused by wording such as that used in the OBRA requirements which makes no distinction between nursing homes with a small number of residents/beds and nursing homes with hundreds of residents/beds. Another ratio focused upon in the literature is the ratio of RNs to total staff.8

2) A second level of complexity arises in the use of the term staff. Some studies/recommendations/regulations lump together registered nurses (RNs), licensed vocational nurses (LVNs or LPNs), and nursing assistants (NAs), some maintain separate calculations for the three types of staff members, and yet others distinguish only between licensed nurses (RNs AND [ LPNs or LVNs] and nursing assistants. (In fact, the OBRA requirements do not address the numbers or ratios of nursing assistants at all).

3) Many factors other than sheer numbers interact to play a crucial role in quality of care—and their importance can sometimes be underestimated by an overemphasis on numbers. These include: rates of staff turnover; staff stability; level of training and type of experience of staff; professional staff mix; use of agency (temporary staff); facility management and organizational structure-- including whether the facility is privately owned, and/or accepts Medicaid as well as Medicare patients.3,8,10

4) Difficulties related to types and sizes of facility especially where short stay rehab services are offered in the same facility as long term residential care—together with the mix in patient acuity associated with each.

5) Measures of quality of care are many and extremely varied across studies. Some studies look at incidence of specific conditions and consider these representative of all potential deficiencies that might occur, for example at a state regulatory site visit. Others look at composite measures. Yet others look at
positive measures or “processes of care” such as assisting residents out of bed, feeding assistance, facilitating residents’ social interaction. Examples of different quality measures, most of which are proxy measures, include:

a. incidence of pressure sores and urinary tract infections
b. better cognitive function
c. a combination of 14 quality indicators derived through “exploratory factor analysis” and looking at percentages of: pressure sores in both low and high risk patients in both short and long stay categories, urinary tract infections, increased need for help with ADLs, presence of moderate to severe pain in both short and long stay patients, physical restraint use, presence of depression or anxiety, catheterization with catheter left in bladder, spending most of time in bed or in a chair, decreased ability to move in/around room, and delirium

d. Weight loss

e. Rates of transfer to hospital

f. Rates of discharge home

g. Mortality rates

h. Fewer antibiotics

i. Lower use of restraints

j. Improved functional outcomes

k. “Deficiencies”—(e.g. “as defined as evaluations of poor quality made by state surveyors under the federal nursing home certification regulations”)[12(p.132)]Sixteen care processes implemented by NAs and measured by direct observation and resident interview which are divided into “four major domains: out of bed/social engagement; feeding assistance; incontinence care; exercise as well as repositioning of the person”[12(p.230)]

6) Use of different data sources: medical records, direct observation, resident interview, survey results, the OSCAR database (Online Survey Certification and Reporting System)

Conclusions and Recommendations?

Wrapping up, we seem to be left with the 2001 Abt/CMS recommendations for “4.1 mean total (nursing aides [NAs] plus licensed nurses) direct care hours per resident per day (hprd) and 1.3 licensed nurse hprd (.75 for registered nurses [RNs] and .55 for licensed vocational nurses [LVNs] [as] the minimum staffing levels associated with a lower probability of poor resident outcomes, such as weight loss and pressure ulcers (Kramer and Fish 1001),[12(p.225)] thresholds which were also supported in the 2001 IOM Report. These studies also “showed that 2.8 to 3.2 NA hprd, depending on the acuity level of the NH population, were necessary to consistently provide all of these daily care processes” (“care related to incontinence care, feeding assistance, exercise, and activities of daily living (ADL) independence enhancement (e.g., dressing)”).[12(p.226-7)] The strength of the evidence supporting these specific recommendations is partial at best—given the complexity of variables summarized above.

Subsequent studies have employed different methodologies but few spell out specifically different quantitative conclusions. If anything the literature of the last few years points strongly to the need to consider interaction effects rather than concentrating on numbers or ratios alone. Factors such as organizational structure, staff mix, staff stability, and consistency of care all play crucial and interacting roles which are difficult to tease out separately. The independent variable --staff ratio-- is thus called into question as the key variable that should be measured. Added to this is the extremely problematic issue of dependent variables—namely quality of care measures. All are by nature proxy measures. There do not appear to be any that seem to have been specifically validated as being more accurate indicators of quality than any others. Thus, a great variety of these proxy measures have been employed—as discussed in number 5 above. Research methodologies—cross sectional vs. longitudinal, from data which is directly observed vs. reported, are also extremely varied and fraught with difficulties. The only real conclusion, therefore, seems to be that which concludes so many reports in the literature of geriatrics—namely that much more research is needed in this area—a need made even more urgent because our long term care population is almost certainly on the verge of tremendous growth in parallel with the exponential growth in our aging population.

References


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Anemia of Chronic Disease
Barry D. Weiss, MD, College of Medicine, University of Arizona

Anemia is common in older adults, and its prevalence rises with age. The National Health and Nutrition Examination Survey (NHANES III) reports that just over one of every ten adults ≥65 years is anemic. For individuals age 85 and older, the rate is 20% in women and 25% in men. Of the many types of anemia that can affect older adults, anemia of chronic disease, with or without chronic kidney disease, is the most common (Table 1).

Table 1. Causes of Anemia in Adults Age ≥65 Years

<table>
<thead>
<tr>
<th>Type of Anemia</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated Causes</td>
<td></td>
</tr>
<tr>
<td>Anemia of chronic disease</td>
<td>19.7%</td>
</tr>
<tr>
<td>Iron deficiency</td>
<td>16.6%</td>
</tr>
<tr>
<td>Anemia of chronic kidney disease</td>
<td>8.2%</td>
</tr>
<tr>
<td>B12 deficiency</td>
<td>5.9%</td>
</tr>
<tr>
<td>Mixed Causes</td>
<td></td>
</tr>
<tr>
<td>Iron deficiency plus folate and/or B12 deficiency</td>
<td>3.4%</td>
</tr>
<tr>
<td>Folate and B12 deficiency</td>
<td>2.0%</td>
</tr>
<tr>
<td>Anemia of chronic disease with chronic kidney disease</td>
<td>4.3%</td>
</tr>
<tr>
<td>Unknown or other</td>
<td>33.6%</td>
</tr>
</tbody>
</table>

Data from Guralnik and the National Health and Nutrition Examination Survey III.

Anemia of chronic disease (ACD), sometimes called anemia of inflammation, is due to the effects of chronic inflammation, which result in release of mediators like interleukins and tumor necrosis factor. These inflammatory mediators cause dysregulation of iron usage — the result being retention of iron in storage cells of the reticuloendothelial system. This limits iron availability for production of red blood cells, and the end result is anemia.

The most common inflammatory processes resulting in ACD are infections, cancers, autoimmune disorders, and chronic kidney disease. In many patients, however, the nature of the inflammatory process is never determined.

Diagnosis
ACD is typically mild (Hgb level 8-10) and normocytic, though microcytosis sometimes occurs. The serum iron level is low in ACD, and this leads some clinicians to misdiagnose it as iron deficiency. But, in ACD the low iron level reflects inability to mobilize adequate iron stores from the reticuloendothelial system into the blood, rather than a deficiency of iron. Body iron stores are actually adequate.

A distinguishing feature between iron deficiency and ACS is that in ACD, low serum iron levels are accompanied by low or low-normal iron binding capacity (ie, low transferrin level). In iron deficiency, on the other hand, low serum iron levels are accompanied by high iron binding capacity (Figure 1).

Further confirmation of the diagnosis can be obtained with a ferritin level. Ferritin is a measure of iron stores, but it also is an acute-phase reactant whose concentration in the blood increases during acute and chronic inflammation. Thus, in iron deficiency, the ferritin level is typically low, whereas in ACD, the ferritin level is often high.

Difficulty in diagnosis occurs when a patient has a mixed anemia — usually ACD co-existing with iron deficiency. If the patient’s iron studies don’t match the patterns shown in the figure, the two diagnoses can often be sorted out by ordering a test called “soluble transferrin receptor” and then calculating the ratio of soluble transferrin receptor to the log of the ferritin level. In patients with ACD alone, the ratio is <1. With both iron deficiency and ACD, the ratio will be >2 (Table 2).

TIPS FOR DEALING WITH ANEMIA OF CHRONIC DISEASE (ACD)
- Don’t make the mistake of diagnosing iron deficiency just because serum iron levels are low. They are low in ACD, too, even though patients with ACD have adequate iron stores.
- Distinguish ACD from iron deficiency with the combination of iron, transferrin, and ferritin levels (Figure 1), supplemented by soluble transferrin receptor levels when needed.
- Don’t treat anemia of ACD with iron unless concomitant true iron deficiency is present.
Elder Care

Treatment

Treat the Chronic Disease  Optimal therapy of ACD is treatment of the chronic disease responsible for inflammation and anemia. But, this is not always possible and other measures are often used.

Transfusion  Patients with ACD sometimes present with severe anemia, in which case transfusion is needed to prevent hemodynamic compromise. Transfusions are typically considered when the hemoglobin level is < 8 mg/dl.

Iron  Keep in mind that despite the low level of serum iron, body iron stores are not deficient in ACD. Thus, iron therapy has no benefit and is not indicated. In fact, studies suggest that iron therapy may be harmful in the presence of chronic inflammation by contributing to endothelial dysfunction and vascular events. The only situations in which iron therapy should be used for ACD are when (a) concomitant true iron deficiency is present or (b) patients are receiving, but not responding to, erythropoietin-like drugs.

Erythropoietic Drugs  Several drugs with erythropoietin-like activity are available in the US, including epoetin alfa, epoetin beta, and darbepoetin. Studies indicate that patients with ACD respond to these drugs with an increase in hemoglobin levels, with the best responses occurring in patients who have connective tissue disorders or chronic kidney disease.

Use of erythropoietic drugs, however, is controversial. Their use — especially when used to raise hemoglobin levels to 11-12 gm/dl, which is the level recommended in some guidelines — has been linked to higher death rates from cardiovascular events, progression or recurrence of certain types of cancer, and an increased rate of venous thromboembolism in patients with cancer. Most experts now feel that if erythropoietic agents are used for ACD, goal hemoglobin levels should be lower than those specified in guidelines. The optimal role of these drugs for ACD is unclear.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Ratio of Soluble Transferrin Receptor to Log of Ferritin Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACD</td>
<td>&lt;1</td>
</tr>
<tr>
<td>ACD + Iron Deficiency</td>
<td>&gt;2</td>
</tr>
</tbody>
</table>

ACD = Anemia of Chronic Disease
Information from Weiss and Goodnough, NEJM, 2005

Figure: Iron Studies in ACD and Iron Deficiency

<table>
<thead>
<tr>
<th>Anemia of Chronic Disease</th>
<th>Iron Deficiency</th>
<th>Mixed Iron Deficiency and Anemia of Chronic Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE</td>
<td>FE</td>
<td>FE</td>
</tr>
<tr>
<td>TF</td>
<td>TF</td>
<td>TF</td>
</tr>
<tr>
<td>FER</td>
<td>FER</td>
<td>FER</td>
</tr>
</tbody>
</table>

Abbreviations and Symbols: FE = Iron, TF = Transferrin, FER = Ferritin

= typically high but may be normal
= typically low but may be normal

References and Resources


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

Editors: Rosemary Browne, MD; Barry D Weiss, MD
Associate Editors: Carol Howe, MD; Jane Mohler, RN, MPH, PhD; Kathryn Coe, PhD; Lisa O'Neill, MPH; and Mindy Fain, MD
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This work was supported by the:
Donald W. Reynolds Foundation, the Arizona Geriatric Education Center, and the Arizona Center on Aging
Driving and the Older Adult
Richard Marottoli, MD, Yale New Haven Health System

As the population ages, the number of older drivers is increasing. Although the absolute number of crashes involving older drivers is low, the number of crashes per mile driven rises with advancing age.

It is important to optimize people’s safety and recommend against driving when it is unsafe. At the same time, however, it is unwarranted to restrict driving and compromise an older person’s mobility and independence when such restriction is unnecessary. Thus, the challenge facing health care providers is to strike a balance between older adult’s safety on the one hand and mobility and independence on the other.

How to evaluate older drivers

Given the many factors that contribute to safe driving, it is not surprising that there is no one measure to identify all individuals at risk. Indeed, even standard clinical dementia tests do not reliably predict safe driving or success on a road test (Table 1).

<table>
<thead>
<tr>
<th>Dementia Test</th>
<th>Cut score</th>
<th>Road Test Pass Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-Mental State Examination</td>
<td>≤ 24</td>
<td>36%</td>
</tr>
<tr>
<td>Clinical Dementia Rating</td>
<td>≥ 1</td>
<td>76%</td>
</tr>
</tbody>
</table>

Information from Neurology, 2010;74:1316–1324

The latest (2010) guidelines from the American Medical Association and the National Highway and Transportation Safety Administration (AMA/NHTSA) provide a stepwise framework for addressing driver safety issues.

Step 1 - Obtain a history of driving frequency, usual destinations and distances, and medical problems that pose a risk to driving. Such medical problems include conditions, medications, or functional impairments (Table 2) that may interfere with the ability to recognize threats, process information, or execute responses. These medical problems should be considered not only to determine risk. Recognition of these medical problems also identifies targets for interventions that can decrease risk and permit continued safe driving.

The history should also include inquiry into whether anyone has concerns about the older adult’s driving safety. Such concerns can arise when the older driver gets lost, or has near misses, moving violations, or crashes. Examination of the older driver’s vehicle by family members can also reveal whether there are scrapes or dents on the vehicle that might indicate unreported minor collisions.

Step 2 - Observe driver performance by having a family member ride with or behind the older driver as the individual drives typical routes - looking for how the driver interacts with traffic and pedestrians, as well as how the vehicle is controlled. If family is unable or unwilling to undertake this assessment, a formal driving evaluation can be performed by specially trained occupational therapists or the state licensing agency.

Step 3 - Make recommendations for change if the aforementioned evaluation convinces you, the patient,

<table>
<thead>
<tr>
<th>Medical Risks for Unsafe Driving in Older Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive disorders: eg, dementia, psychiatric illness</td>
</tr>
<tr>
<td>Medications causing sedation or cognitive impairment</td>
</tr>
<tr>
<td>Movement Problems: eg, neuropathy, myopathy, arthritis</td>
</tr>
<tr>
<td>Visual problems: eg, cataracts, macular degeneration</td>
</tr>
</tbody>
</table>

Information from JAMA, 2010; 303:1632-41

TIPS FOR DEALING WITH DRIVING IN OLDER ADULTS

- Be alert for the possibility of unsafe driving when older patients get lost, or have near misses, moving violations, or crashes.
- Be aware that standard clinical dementia tests do not reliably predict safe driving or the ability to pass a road test.
- If there is concern about safe driving, arrange for observation of driver performance by family, or a formal road test.
- Before recommending cessation of driving, consider whether a change (limitation) in driving pattern might permit an individual to continue driving safely and thus maintain mobility and independence.
- Know your state laws about reporting potentially unsafe drivers to the department of motor vehicles.
Elder Care

and/or the patient's family that there is need for change. Several recommendations are possible:

- **Change driving patterns** — Consolidate driving so that fewer trips are made, and limit driving to familiar routes. Avoid high-risk situations in which older drivers often experience collisions, such as merging into traffic or making left-hand turns into oncoming traffic without a turn arrow. Some people (up to 40% in one study) with mild dementia may be able to pass road tests and thus safety drive under such conditions, at least for the time being. Interval reassessment will, of course, be needed.

- **Address risk factors** — When possible, address medical conditions or modify medication regimens to improve function. Optimize prescription lenses, and consider an extra-wide rear-view mirror to minimize blind spots, though benefit of such mirrors is uncertain. Be sure the car is properly fit to the driver, such as making sure feet adequately reach the brake and fuel pedals (with heels on the floor) and that the driver is positioned at least 10" from the steering wheel.

- **Improve driving performance** — Recommend on-road and classroom instruction. These are available through the American Automobile Association, the American Association of Retired Persons, and others.

**What if driving needs to stop?**

If interventions are not successful or possible to assure safety, the individual should stop driving. This is a serious step because it limits an older adult’s ability to participate in society, and is associated with high rates of depression.

One approach is to give the patient the autonomy to make the decision based on your recommendation to stop driving (a similar approach can be used when recommendations are to continue driving, but on a limited basis). When the patient has cognitive impairment, obtain permission to involve the family in discussions.

The other approach, if patients will not agree to stop driving, is to report the impaired driver to the department of motor vehicles for license revocation. If all else fails, consider implementing measures to prevent driving, such as hiding keys or removing or even disabling the vehicle.

If driving has to stop, you should work with the patient and family to identify other transportation sources to help the patient maintain mobility and independence. Social workers or local-area agencies on aging can often provide information about transportation alternatives.

**Legal implications for clinicians**

Adhere to the requirements of your state laws regarding the need to report unsafe drivers to the department of motor vehicles. Whether and when to report to the state licensing agency that an older adult should not drive depends, in part, on your state laws. Some states have voluntary reporting laws, while others require reporting of any suspected unsafe driver or individuals with certain medical diagnoses.

Document all discussions in the medical record. When older adults continue driving, minimize use of psychoactive medications and warn about their potential negative effects, adjust the timing, dose, and frequency to least likely affect driving, and ideally have the patient not drive when starting or adjusting the dose.

In very high risk individuals with substantial impairment, multiple adverse driving events, or unwillingness to accept your recommendations, consider reporting to the state licensing agency even if not required. If concerned about the negative effects of this action on the clinician-patient relationship, consider a referral to a geriatric assessment center for further discussion and evaluation. Regardless of approach, the goal is to optimize safety and mobility.

**Planning for the Future**

Even if interventions are successful and driving can continue, it is helpful to discuss planning for future mobility and independence when an individual may no longer be safe to drive. This is especially important if an older adult has a condition or impairment, such as a neurodegenerative disorder, that is expected to worsen over time.

**References and Resources**

CarFit.org. A joint endeavor of the American Society on Aging, the American Automobile Association, the American Association of Retired Persons, and the American Occupational Therapy Association.

Carr DB, Ott BR. The Older Adult Driver with Cognitive Impairment. JAMA. 2010; 303(16):1632-1641.


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

Editors: Rosemary Browne, MD; Barry D Weiss, MD

Associate Editors: Carol Howe, MD; Jane Mahler, RN, MPH, PhD; Kathryn Coe, PhD; Lisa O'Neill, MPH; and Mindy Fain, MD

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Donald W. Reynolds Foundation, the Arizona Geriatric Education Center, and the Arizona Center on Aging
Hypothyroidism in the Very Old
Barry D. Weiss, MD, College of Medicine, University of Arizona

Although the US Preventive Services Task Force concluded in 2004 that there is insufficient evidence to support a recommendation for or against routine screening of adults for hypothyroidism, a variety of professional organizations have, at one time or another, endorsed such screening. The widespread availability of thyroid stimulating hormone (TSH) assays has made it easy to test for hypothyroidism. Because of concern that they may overlook the subtle symptoms of hypothyroidism in older adults, providers commonly order TSH screening tests to check for hypothyroidism in these patients.

High TSH levels (indicating overt or subclinical hypothyroidism) are found in up to 20% of older adults. Providers must decide whether these individuals need thyroid replacement therapy.

Determining whether or not to treat individuals for hypothyroidism can be difficult in the population of the oldest old (those over 80 years of age) because the evidence base is limited and conflicting. The decision may also differ depending on whether the patient has subclinical hypothyroidism (elevated TSH and normal levels of thyroid hormone) or overt hypothyroidism (elevated TSH and low levels of thyroid hormone).

Hypothyroidism and Heart Disease

Most providers are aware that overt hypothyroidism (OH) is associated with cognitive dysfunction, fatigue, constipation, weight gain, and a variety of other findings (Table 1). Similar symptoms may also be present to a lesser degree in individuals with subclinical hypothyroidism (SH), while others with SH have no symptoms at all.

Table 1. Common Signs and Symptoms of Hypothyroidism

<table>
<thead>
<tr>
<th>Category</th>
<th>Signs and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>fatigue, lethargy, hoarse voice</td>
</tr>
<tr>
<td>Metabolic</td>
<td>hyperlipidemia, weight gain, intolerance to cold</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>bradycardia, hypertension</td>
</tr>
<tr>
<td>Neurologic</td>
<td>depression, cognitive slowing</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>constipation</td>
</tr>
<tr>
<td>Dermatologic</td>
<td>dry skin, non-pitting peripheral edema</td>
</tr>
</tbody>
</table>

In all of these situations — OH, SH with symptoms, and SH without symptoms — treatment decisions for very old individuals are complicated by the fact that people with hypothyroidism have an increased risk of coronary heart disease (CHD). In SH, the risk occurs when the TSH level is 10 mIU/L or higher.

The risk of CHD occurs over and above the age-related increase in CHD. The reason for the increased risk of CHD in hypothyroidism is unclear, but may be related to the hypertension and dyslipidemia that accompany hypothyroidism.

TIPS ON TREATING HYPOthyroidISM IN VERY OLD ADULTS

- In the absence of symptoms, avoid treating subclinical hypothyroidism in people over 70-80, at least until the TSH is >10 mIU/L.
- When treating overt hypothyroidism or symptomatic subclinical hypothyroidism, start thyroxine therapy at a low dose (12.5-25mcg/day) and increase by 12.5-25 mcg increments every 4-6 weeks. Seek a goal TSH level slightly above the normal range to minimize the cardiototoxic effects of thyroid hormone.
- Avoid overtreatment (suppression of TSH to below normal) as supratherapeutic hormone levels lead to osteoporosis, atrial fibrillation, and exacerbations of coronary artery disease.
Elder Care

Subclinical Hypothyroidism  A meta-analysis involving 55,287 adults showed an increased risk of symptomatic CHD in patients with SH when the TSH is >10 mIU/L. But, the risk declines with age (Figure 1). For individuals with SH who are younger than 50, the risk of symptomatic CHD is more than triple the risk in people with normal thyroid function. In people older than 70-80, however, there is no increased risk. And in those over 85, the risk of symptomatic CHD in individuals with SH is actually lower than in age-matched controls.

Thus, there may be a “protective” effect of SH in very old individuals. A relatively hypothyroid state decreases myocardial oxygen demand in patients with underlying CHD, thereby lowering the risk of cardiac symptoms and death. For this reason, in the absence of hypothyroid-related symptoms that call for treatment, many experts recommend not treating asymptomatic SH in elders > 80 years.

Symptomatic Hypothyroidism  Treatment of symptomatic SH or OH in very old adults has more consensus agreement, but requires a different approach than in younger patients. In older adults, most experts agree that the benefits of thyroid replacement outweigh the risks of treatment when the serum TSH is > 10 mIU/L. With TSH levels between 4.5 – 10 mIU/L, expert opinion varies greatly, and the provider must make their own best clinical judgment for the individual patient. In all cases, however, due to the high rate of symptomatic or occult CHD in very old individuals, and the even higher rate in those with hypothyroidism, thyroid replacement should be started at low doses and increased slowly (Table 2) to avoid exacerbating cardiac disease.

While in younger individuals the goal of treatment is to restore a euthyroid state by lowering TSH levels into the normal range, in older individuals it may be preferable to maintain the TSH level slightly above normal. This approach takes advantage of the cardioprotective effect of mild hypothyroidism discussed earlier, reducing chances that thyroid replacement will aggravate CHD.

Table 2. Recommended Dose of L-Thyroxine for Very Old Individuals or People with Known Coronary Heart Disease

- Starting Dose: 12.5-25 mcg/d
- Dose Increment: Increase by 12.5-25 mcg/d at 4-6 week intervals

Overtreatment

It is important to avoid overtreatment (i.e. replacement doses of thyroid hormone that causes TSH to fall below the normal range). Research shows that such overtreatment occurs in as many as 30% of patients taking thyroid replacement therapy. In addition to exacerbating CHD, overtreatment can lead to osteoporosis, atrial fibrillation and a significant increase in mortality rates.

Summary

At present, evidence is not sufficient to allow a consensus guideline for routine screening of asymptomatic older adults for hypothyroidism, although most experts do agree that “aggressive case-finding” is appropriate when evaluating older patients. Similarly, expert panels differ in their guidelines for treatment of documented subclinical or mild hypothyroidism, particularly for those with TSH between 4.5-10 mIU/L. For subclinical disease, the provider is left to their own best judgment on the risks and benefits of treatment, with the presence of symptoms often helping to guide the decision. In general, most experts agree that the benefits of treatment outweigh the risks for TSH >10 mIU/L. For the oldest old, starting with the lowest dosing (12.5-25 micrograms/day) is recommended.

References and Resources


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

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Supported by the: Donald W. Reynolds Foundation, the Arizona Geriatric Education Center, and the Arizona Center on Aging
MEDICATION-INDUCED HYPOKALEMIA: A COMMON PROBLEM

Barry D. Weiss, MD, College of Medicine, University of Arizona

Hypokalemia is one of the most common electrolyte disorders seen in both outpatient practice and inpatient care. It is common in older adults, and increasing age is associated with a marked increase in the incidence of hypokalemia. In fact, in comparison to younger adults, an 80-year old has more than triple the risk of having a potassium level <3.0 mm/L. Gender also confers risk, with women more likely than men to have a low potassium level.

A variety of medical illnesses, some serious, can cause hypokalemia (Table 1). Providers should be alert for those illnesses when evaluating patients who have medications that cause hypokalemia, even in therapeutic doses. This issue of Elder Care will review the most common hypokalemia-causing drugs. These and other medications are listed in Table 2. In addition to medication, hypokalemia can also be caused by the ingestion of large quantities of caffeine or licorice.

Although older adults have been reported to experience profound weakness from hypokalemia, more commonly there are no symptoms. Instead, low potassium levels are often discovered incidentally during routine blood testing. In the absence of blood testing, low potassium levels may go undetected and drop to the point that cardiac rhythm disturbances occur. Thus, when patients are taking medications known to cause hypokalemia, interval monitoring of potassium levels should be considered.

Diuretics
Diuretic therapy causes renal loss of potassium and is the most common cause of hypokalemia. It can occur with both thiazide-type diuretics and with loop diuretics such as furosemide. With loop diuretics, hypokalemia can occur even when potassium supplementation is given.

Laxatives and Enemas
Large doses of laxatives and enemas – particularly phenolphthalein laxatives and/or sodium polystyrene sulfonate – can cause loss of potassium in the stool. It is important to question patients about laxative use because they may not report it unless asked.

Medications for COPD
Sympathomimetic drugs, such as beta-adrenergic bronchodilators used to treat COPD, cause a shift of potassium from the serum into cells, thereby lowering serum potassium levels. The effect is potent, with a single nebulized albuterol treatment lowering potassium levels by 0.2-0.4 mmol/L, and a repeat dose within an hour dropping levels of by nearly 1 mmol/L.

TIPS ABOUT MEDICATION-INDUCED HYPOKALEMIA IN OLDER ADULTS

- Keep in mind that older adults are at higher risk for medication-induced hypokalemia.
- Be alert for hypokalemia when patients are taking common offending drugs—
  diuretics, laxatives, COPD medications, fludrocortisone, high dose antibiotics, high-dose insulin
Theophylline, also sometimes used for treatment of COPD, stimulates release of sympathetic amines. Thus, similar to beta adrenergics, they cause a shift of potassium into cells and can lower serum potassium levels.

Oral or IV steroids with glucocorticoid properties, such as prednisone and hydrocortisone sometimes used to treat COPD, increase renal potassium excretion. When used chronically, potassium levels can fall by up to 0.4 mmol/L.

Mineralocorticoids
The mineralocorticoid fludrocortisone is used to treat orthostatic hypotension due to autonomic dysfunction in Parkinson's disease or other conditions by causing renal sodium and fluid retention. A byproduct of sodium retention is renal potassium loss, which can cause hypokalemia.

<table>
<thead>
<tr>
<th>Table 2. Medications that Cause Hypokalemia</th>
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<tbody>
<tr>
<td>Medication Class</td>
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<tr>
<td>------------------</td>
</tr>
<tr>
<td>Diuretics</td>
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<td></td>
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<tr>
<td>Laxatives</td>
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<td></td>
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<tr>
<td>COPD Medications</td>
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<tr>
<td></td>
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<tr>
<td>Mineralocorticoids</td>
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<tr>
<td>Antimicrobials</td>
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<tr>
<td>Insulin</td>
</tr>
<tr>
<td>Other Medications</td>
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</tbody>
</table>

Antimicrobials
Most providers do not think of antibiotics as a cause of hypokalemia. In large doses, however, penicillin, ampicillin, nafcillin, or carbenicillin can induce renal potassium excretion. The same effect can occur with aminoglycoside therapy and amphotericin B.

Insulin
Routine outpatient insulin treatment does not cause significant hypokalemia. When administered in large doses, however, such as for treatment of the non-ketotic hyperosmolar state that sometimes occurs in older diabetics, insulin shifts potassium into cells and can result in marked serum hypokalemia. Intravenous potassium supplementation is often needed.

References and Resources

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