Delirium is an important marker of mortality.

**Background:** Delirium is a geriatric syndrome characterized by acute decline in memory and attention. It is known that hospitalized patients with delirium have higher rates of mortality, morbidity, and loss of independence. The cost of delirium is $100 billion per year. Patients admitted to post-acute care (PAC) with delirium have higher mortality than those with no delirium. This study was limited by assessing delirium only 1 time. It is not known what the effect of persistent delirium is on mortality in this subset of patients.

**Objective:** To study the association between persistent delirium and mortality in a cohort of patients admitted to a PAC.

**Participants/Methods:** Participants were drawn from a previous trial of a delirium abatement program (DAP) involving 8 nursing facilities in the Boston area. This program did not demonstrate any benefit for patients with delirium. For this study, participants were drawn from the control arm of the study. Mortality information was obtained from the National Death Index (NDI). Tests done included the Mini-Mental State Exam (MMSE), Digit Span, Delirium Symptom Interview, and Confusion Assessment Method at baseline 2, 4, 12, and 26 weeks.

**Results:** 412 subjects were included in the trial. Average age was 84 years, 65% were women, and MMSE score was 12.5. Of patients, 38% had dementia. One-year mortality was 39%. Delirium prevalence in survivors decreased over time: 100% at baseline, 67% at 2 weeks, 56% at 4 weeks, 40% at 12 weeks, and 32% at 26 weeks. At 6 months, one third of patients had delirium. Participants with delirium were 3 times more likely to die during the study period (1 year) as compared to those with no delirium. This association persisted when adjusted for other factors and remained strong in participants with and without dementia. The risk of death decreased with resolution of delirium.

**Conclusions:** Delirious patients admitted to PAC have higher mortality rates if they have persistent delirium over 1 year.

**Reviewer's Comments:** Delirium is an important marker of poor outcomes. Health care workers should be vigilant in recognizing patients with delirium and developing protocols to improve care. (Reviewer-Ariba Khan, MD).

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Keywords: Persistent Delirium

Print Tag: Refer to original journal article
The primary care physician is charged with communicating with multiple physician colleagues to coordinate care.

**Background:** My colleague and I shared lunch in my office one day this week. He is the leader of seniors' care for a large health care system; I am charged with the same role for his direct competition. At lunch, he told me of his practice frustrations. He noted that he often admitted older Medicare patients who had received hospital care from our facilities, who were then transferred to his hospital system for rehabilitation. There was often simply a discharge summary with medications, but no additional communication. He noted the lack of primary care involvement at each site and the lack of a common medical record for providers to access information. This lack of sharing of clinical information between providers is a common problem for Medicare beneficiaries. Older patients with complex clinical problems require optimal communication and coordination of care. We discussed the "advanced medical home" concept as a possible solution that will use health information systems to improve coordination of care.

**Objective:** To determine how many physician peers provide care to Medicare patients of a primary care physician.

**Methods:** Researchers used a survey of 2284 primary care physicians who had participated in the Community Tracking Study between 2004 and 2005 to identify primary care providers. Researchers then used Medicare claims data to calculate the number of other physicians (and practices) that a primary care physician's Medicare patients visit over the course of 1 year.

**Results:** Approximately 575,000 Medicare beneficiaries had at least 1 visit to the 2284 primary care physicians in 2005. Each primary care physician treated 264 unique Medicare beneficiaries, including about 113 (38%) "core" primary patients and 151 non-primary patients. The standard primary care physician had peers consisting of 117 distinct practices and 229 unique physicians. Rural physicians worked with slightly fewer peers. Those physicians in smaller practices and those who treated patients with chronic illnesses worked with more physician peers.

**Conclusions:** Older persons receive care from multiple physicians in multiple different practices. The primary care physician must be able to communicate with multiple providers to be able to coordinate care. This study does not take into account the need to coordinate care among additional health care providers such as physical therapists and social workers.

**Reviewer's Comments:** The older person who receives care from multiple providers or at multiple health care settings is vulnerable to the chance that their care may not be well coordinated. We must advocate for systems of care, such as a single medical record or a single medication list, which will improve the ability of primary care providers to coordinate the care. (Reviewer-Michael L. Malone, MD).

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Keywords: Care Coordination

Print Tag: Refer to original journal article
Patients with chronic lymphocytic leukemia appear to have B-cell clones detected in peripheral blood for 6 months to 6 years before their diagnosis.

**Background:** The most common type of leukemia among adults in Western counties is chronic lymphocytic leukemia (CLL). This disorder usually occurs among persons aged >60 years. CLL is prevalent because of the increasing numbers of older persons and because a long median survival associated with this disease. CLL is characterized by the accumulation of large numbers of mature-appearing B-lymphocytes in the bone marrow, peripheral blood, and lymphoid organs. These B cells are abnormal qualitatively and quantitatively, as they result in hypogammaglobulinemia, cytopenias, and a frequent association with Coombs-positive hemolytic anemia. Some patients with advanced forms of CLL may develop cytopenia and require chemotherapy and/or radiation therapy. Many others, with less advanced forms of CLL, have a good prognosis without specific therapy. Researchers have noted that some healthy adults have small B-cell clones with a surface phenotype similar to that of CLL circulating in the peripheral blood. These persons have no evidence of other lymphoproliferative disorders. The prevalence of this monoclonal B-cell lymphocytosis (MBL) is reportedly 3% to 5% among the general population aged >50 years.

**Objective:** To determine if having MBL increases the risk of developing CLL.

**Participants:** >77,000 adults who were cancer free at baseline had their blood stored and were subsequently followed. Those who developed CLL were identified. Researchers then went back to define the association between MBL and CLL.

**Methods:** Between 1992 and 2001, >77,000 subjects in the Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial were enrolled from 10 study centers in America. These adults were aged 55 to 74 years; 129 persons had incident CLL and, of these, 45 had a blood sample that had been obtained at least 3 months before the date of their diagnosis.

**Results:** A total of 45 patients with CLL who had their blood cryopreserved were studied. Average age of subjects was 70 years. Median time between the pre-diagnostic blood sample and subsequent diagnosis of CLL was 3 years. Some subjects were able to have pre-diagnostic determinations of blood >6 years before their diagnosis.

**Conclusions:** Pre-diagnostic B-cell clones were present in 44 of 45 older patients with CLL. Some blood tests of those with CLL had early abnormalities up to 6 years before their diagnosis.

**Reviewer's Comments:** This study gives us some additional information about the natural history of CLL. It appears that there is a precursor state of 6 months to 6 years before development of clinically recognized leukemia. (Reviewer-Michael L. Malone, MD).
More Evidence of Potential Harm of Estrogen, Progestin in Postmenopause

Breast Cancer After Use of Estrogen Plus Progestin in Postmenopausal Women.
Chlebowski RT, Kuller LH, et al:


In this study, the rate of breast cancer decreased after postmenopausal women stopped taking estrogen and progestin.

**Background:** Prior to 2002, postmenopausal women in America had commonly been prescribed estrogen and progestin for prevention of osteoporosis and for symptoms of hot flashes. This treatment was commonplace and viewed as standard therapy. In 2002, data from the Women's Health Initiative (WHI) demonstrated that previously accepted benefits of estrogen and progestin therapy do not outweigh the risks. Estrogen therapy was able to prevent or delay bone loss, and it was able to help women reduce the risk of fractures. However, because of potential risks associated with estrogen, the FDA no longer approves use of estrogen for osteoporosis treatment, unless other therapies cannot be used. Use of estrogen and progestin decreased in the United States after the WHI. There was also noted to be a decrease in the rate of breast cancer. The decreased use of postmenopausal hormones was thought to be related.

**Objective:** To determine the risk of breast cancer among those women who had taken postmenopausal hormones.

**Methods:** Women from the WHI study were followed during and after the study period. Those who had been taking estrogen and progestin were compared to those who had taken a placebo. Rates of breast cancer were tracked for each group.

**Results:** There were >15,000 women who were followed in the clinical trial. These women had no prior history of breast cancer. Approximately half had received previous hormone therapy, and the others had received placebo therapy. Of women, 65% were aged between 60 and 79 years. More than 80% were white, and two thirds had some schooling after high school. The annualized incidence of breast cancer was greater in the hormone-treated group than in the placebo group during the study period. The number of diagnoses of breast cancer in the hormone-treated group decreased by 28% from the last year of the study to the first year of the hormone-free period.

**Conclusions:** The incidence of breast cancer, among those women who had been treated with hormones, decreased after stopping the medication.

**Reviewer's Comments:** This study provides further evidence of the increased risk of breast cancer from hormone replacement therapy. The compelling aspect of the study is that when the hormone therapy exposure was removed, the rate of breast cancer decreased. This study reminds me of the continued importance of an evidence-based approach to many of our standard interventions. (Reviewer-Michael L. Malone, MD).

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Keywords: Breast Cancer

Print Tag: Refer to original journal article
Osteoporotic fractures are associated with an increased mortality rate for older persons.

**Background:** When older persons have a significant fracture of the hip or pelvis, they frequently require a period of rehabilitation. They may receive that care in a sub-acute rehab center or in an acute rehab facility. The course of their care may be complicated by medical complications (such as deep venous thrombosis) during their acute care setting. In addition, there may be additional changes that occur after their recovery that results in the older person not being able to return home. Some seniors have a higher mortality rate after hip or vertebral fracture, especially in the first year following the fracture. Those who have had 1 fracture are at an increased risk for a subsequent fracture.

**Objective:** To assess (1) the long-term mortality risk after all types of fractures, and the association of subsequent fracture with that mortality risk; (2) which clinical features at the time of the fracture predict future mortality; and (3) the effect of bone mineral density on mortality.

**Design/Participants:** Longitudinal population-based study of men and women aged ≥60 years in Dubbo, Australia. The population of Dubbo included 2245 women and 1989 men who were aged ≥60 years in 1989.

**Methods:** Between April 1989 and May 2007, 952 women and 343 men sustained at least 1 minimal trauma fracture. Of those who had a fracture, 452 women and 162 men agreed to participate in the study. They were followed regularly for a median of 13 years.

**Results:** Among those seniors who did not have a fracture, the mortality rate was 4.3 per 100 person-years for women and 5.5 per 100 person-years for men. Among fracture participants, the rate of death was 7.8 per 100 person-years for women and 11.3 per 100 person-years for men. Thus, older persons who had a fracture had a higher mortality rate than did those who had no fracture. Mortality rates were higher for seniors with all types of fractures. The increased mortality risk continued for up to 5 years after the fracture but declined afterward. Predictors of mortality after any fracture included age, quadriceps weakness, and subsequent fracture.

**Conclusions:** Osteoporotic fracture is associated an increased risk of mortality for older adults and that risk continues for approximately 5 years subsequent. Several clinical features of the older person at the time of fractures are associated with an increased risk of mortality.

**Reviewer's Comments:** This is a nice epidemiologic study of risk of mortality associated with osteoporotic fractures in older adults. The practical point that I would emphasize is to address the whole person, and to assess if the patient has advanced directives. (Reviewer-Michael L. Malone, MD).

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Keywords: Osteoporotic Fracture

Print Tag: Refer to original journal article
Effects of Care Coordination on Hospitalization, Quality of Care, and Health Care Expenditures Among Medicare Beneficiaries: 15 Randomized Trials.
Peikes D, Chen A, et al:
JAMA 2009; 301 (February 11): 603-618

Coordination of care programs for older persons with chronic medical conditions may not be less expensive.

**Background:** Caring for older adults who have chronic medical conditions is part of the usual responsibilities of a geriatrician. The premise of geriatrics care is that we use an interdisciplinary team to guide assessment and treatment of seniors with complex medical-psychosocial conditions. Payment to physicians for education and coordination of care is not optimal, currently. As a result, many patients receive care that is not communicated among multiple providers. Recent legislation provided Medicare the mandate to study methods of care coordination, in the fee-for-service setting. The demonstration projects specifically were designed to determine if care coordination resulted in (1) reduced total Medicare expenditures, including program fees, or (2) an increased quality of health care services and patient satisfaction.

**Objective:** To describe the results of 15 randomized controlled trials, each of which used multiple types of interventions to improve coordination of care for Medicare beneficiaries (in the fee-for-service setting).

**Methods:** The programs began in 2002 and operated for 4 years. The study population included those who had 1 or more chronic medical condition targeted by each local program. Interventions of the 15 studies varied; however, all programs assigned patients to a care coordinator. Almost all programs made major attempts to improve communication between physicians and patients as well as attempts to improve transitions in care. The Center for Medicare and Medicaid Services paid each program a fee of about $164 per member per month for the trial.

**Results:** Only 1 of 15 programs showed a significant decrease in the rate of hospitalization of their Medicare beneficiaries. This program was able to decrease their rate of hospitalization by 17%. One program had an increase in hospitalization rate compared to the control group, and the other 13 programs showed no significant difference in hospitalizations. None of the 15 care coordination programs decreased health care expenditures. With 2 programs, patients in treatment groups described that their physicians were doing a good job at keeping in touch with each other and explaining their treatments. Generally, those who were in the treatment groups at these sites had better patient satisfaction.

**Conclusions:** Care coordination as outlined by the interventions at these 15 Medicare demonstration sites did not decrease hospitalization rates or health care expenditures.

**Reviewer's Comments:** This study deals a major blow to the premise that coordination of care will help a Medicare population. There is major legislation that is being reviewed by Congress to support improved funding of geriatric assessments and management. The premise is that this intervention should be targeted to improve outcomes of care for vulnerable elders. This study causes geriatricians to pause. (Reviewer-Michael L. Malone, MD).

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Keywords: Care Coordination

Print Tag: Refer to original journal article
Combined use of central nervous system medications in elderly patients may affect their cognition.

**Background:** Active central nervous system (CNS) medications such as benzodiazepines, opioids, tricyclic antidepressants, traditional antipsychotics, and the new antidepressants, are commonly prescribed to older adults. These medications frequently cause side effects, including problems with mobility, falls, and cognitive decline.

**Objective:** To examine whether combined use of multiple CNS medications over time is associated with cognitive change.

**Design:** Longitudinal cohort study conducted in Pittsburgh, Pennsylvania, and Memphis, Tennessee.

**Participants:** 2737 healthy adults aged ≥65 years enrolled in the Health, Aging and Body Composition study with no cognitive impairment at baseline.

**Methods:** CNS medication use, duration, and dose were determined in the first year of study, after 3 years, and after 5 years. Cognitive function was measured using the modified Mini-Mental State Examination (MMSE) at baseline and after 3 and 5 years. Outcome variables were incident cognitive impairment, defined as modified MMSE score <80, and cognitive decline, defined as decline in modified MMSE by ≥5 points.

**Results:** After 5 years, 7.7% of participants had incident cognitive impairment, 25.2% demonstrated cognitive decline, and CNS medication use increased from 13.9 at baseline to 17.1 after 5 years. Longer duration and higher doses of CNS medications was associated with a greater risk of cognitive decline, compared to that in non-users. **Conclusion:** Combined use of CNS medications, especially at higher doses, appears to be associated with cognitive decline in older adults.

**Reviewer's Comments:** This large-scale study is one of the first studies to explore the relationship between combined use of CNS active medication and cognitive decline in healthy community-dwelling older people. The result of this study reaffirms those of previous studies, which focused only on single use of CNS medication. Future studies should explore and compare the effect of combined CNS medication use on more vulnerable older adults. (Reviewer-Soryal A. Soryal, MD).

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Keywords: Central Nervous System Medications

Print Tag: Refer to original journal article
Low diastolic blood pressure and high pulse pressure are associated with a greater risk of death in older hypertensive patients.

Background: Hypertension is the most common cardiovascular risk factor in older adults. More than 70% of people aged ≥65 years has high blood pressure.

Objective: To examine the relationship between office and ambulatory systolic blood pressure, diastolic blood pressure, and pulse pressure and total mortality in older patients with hypertension.

Design: Observational prospective cohort study, conducted in a hypertension outpatient clinic in the University of Florence, Italy. All participants used 24-hour ambulatory blood pressure monitoring.

Participants/Methods: 805 patients age ≥60 years with hypertension underwent office and ambulatory blood pressure measurements. Mortality was assessed after a mean follow-up of 3.8 years.

Results: Of 805 patients, 107 died after 3.8 years. Participants who died had higher systolic blood pressure and pulse pressure, and had lower diastolic blood pressure during office and ambulatory measurements. Mortality rates were greater with higher systolic blood pressure and were lower with higher diastolic blood pressure. The adjusted hazard of death increased linearly with increasing ambulatory systolic blood pressure and pulse pressure, and it decreased significantly with increasing ambulatory diastolic blood pressure.

Conclusions: Low diastolic blood pressure and high pulse pressure are associated with a greater risk of death in older hypertensive patients. Reaching optimal systolic blood pressure levels should not be obtained at the expense of an excessive diastolic blood pressure reduction.

Reviewer's Comments: This well-designed study was conducted over a period of 5 years but included a relatively small number of patients. This study suggests that reaching a systolic blood pressure goal at the expense of an excessive diastolic blood pressure reduction (<80) may increase morbidity and mortality for high-risk patients. Future studies should search for blood pressure medicine that electively decreases systolic blood pressure rather than those that lower diastolic blood pressure. (Reviewer-Soryal A. Soryal, MD).
A combination of testosterone and a nutritional supplement decreases the number of hospital admissions in malnourished elderly patients.

**Background:** Hospitalization is common in malnourished elderly subjects.

**Objective:** To evaluate the effect of nutritional supplementation and administration of testosterone on hospitalization.

**Design:** Randomized, partially blinded controlled study.

**Participants:** The authors screened 281 non-institutionalized but malnourished older subjects, of whom 49 were enrolled.

**Methods:** Nutritional status was assessed with the Mini Nutritional Assessment. Participants were malnourished if they had a score of <17. Body composition was assessed by dual x-ray absorptiometry. Primary outcomes were hospital admissions during the follow-up period of 1 year. Subjects were randomly assigned to 1 of 4 groups. Group 1 was considered "no treatment" (standard care plus placebo). Standard care was given to everybody with the advice to have 3 full meals per day and specific recommendations on what to eat. Group 2 received testosterone orally in doses of 40 mg/day for women and 80 mg twice day for men combined with standard care. Group 3 received a placebo plus a nutritional supplement containing 275 kcal. Group 4 received this nutritional supplement combined with testosterone.

**Results:** The authors found typical expected changes with testosterone treatment. Percentage of body fat increased in all groups. Lean mass decreased in all groups except in subjects who were taking testosterone only. The authors found that subjects receiving the combination therapy of supplements plus testosterone had zero hospital admissions. There were 9 admissions in the group with no treatment, 5 in the group treated with the supplement only, and 4 in the testosterone-treated group ($P=0.03$). Comparison between the no-treatment group and the combined treatment group did not reach statistical significance ($P=0.06$). The authors also found that the combined treatment group had fewer days in the hospital ($P=0.04$).

**Conclusions:** Undernourished, community-dwelling older people had a significant reduction in the number of hospitalizations and the number of days spent in the hospital. Treatments were all well tolerated.

**Reviewer's Comments:** These findings are not ready for prime time use. This was a small study, and the optimal dose of testosterone is unclear. It is unclear to me what the effect was on elective versus non-elective admissions; disease severity among the 4 groups was not detailed. Furthermore, there was no placebo nutritional supplement, only a testosterone placebo. Nevertheless, interesting, since we do not know how to improve the nutritional status in our sick patients and what the underlying mechanisms are for sarcopenia. (Reviewer-Norman G. Egger, MD).

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Keywords: Testosterone

Print Tag: Refer to original journal article
Vitamin K does not reduce bleeding events in over-anticoagulated patients.

**Background:** It is common practice to administer oral vitamin K to counteract a supratherapeutic international normalized ratio (INR) in order to prevent major bleeding events. Little is known whether vitamin K reduces bleeding without actually increasing the risk for thromboembolism.

**Objective:** To compare low-dose oral vitamin K versus placebo in patients with supratherapeutic INRs.

**Design:** Multicenter, placebo-controlled randomized trial with concealed allocation.

**Participants:** Patients were enrolled from 14 anticoagulant therapy clinics in Canada, the U.S., and Italy. INR values were between 4.5 and 10.0, and there was no evidence of bleeding at enrollment.

**Methods:** Main outcomes were bleeding events (in particular, major bleeding events), thromboembolic events, or death. Major bleeding events were defined as all fatal events, events requiring transfusions of ≥2 units of packed red blood cells, or when there was a need for any therapeutic intervention necessary to stop bleeding. The vitamin K dose was 1 single dose of 1.25 mg versus placebo.

**Results:** 8 patients in the vitamin K group versus 4 in the placebo group were lost to follow-up, leaving 347 versus 365 patients for the intention-to-treat analysis. The INR had decreased by 2.8 in the vitamin K group versus 1.4 in the placebo group ($P < 0.001$) within 24 hours of administration. After 7 days, there were 9.2 bleeding events in the placebo group versus 7.9 in the vitamin K group ($P = 0.52$). After 90 days, there were 16.3% of patients in the placebo group with bleeding versus 15.8% in the vitamin K group ($P = 0.86$). Major bleeding events occurred in 1.1% in the placebo group and 2.5% in the vitamin K group ($P = 0.22$). Four patients in the vitamin K group had a thromboembolic process versus 0.8% in the placebo group ($P = 0.62$).

**Conclusions:** Low-dose oral vitamin K, compared to placebo, did not decrease bleeding events in patients with supratherapeutic INRs between 4.5 and 10.0. There were also no differences in the frequency of thromboembolic processes (including cerebrovascular accidents).

**Reviewer's Comments:** The strength of this study is that it is set up as a randomized placebo-controlled study with concealed allocation. Furthermore, there was an intention-to-treat analysis and complete follow-up for almost all patients. The weakness was that the study was not powered enough to detect small differences in low-frequency major bleeding events. I have my reservations to the "lower-than-usual" dose of vitamin K (1.25 mg). Common practice is mostly 2.5 to 5.0 mg, depending on the INR level. Also, the authors did not provide us with information as to differences of comorbidities (such as liver disease) between groups nor presence of potential interactions with warfarin, such as medications. Nevertheless, this important study addresses an extremely common clinical scenario in older patients. (Reviewer-Norman G. Egger, MD).