

Prevention for the Older Woman

Mobility: A practical guide to managing osteoarthritis and falls

Barbara J. Messinger-Rapport, MD, PhD • Holly L. Thacker, MD

By anticipating issues of mobility, physicians can help older women lead more independent and satisfying lives. Osteoarthritis is a major cause of physical disability in older women. Aerobic exercise, resistance training, and judicious analgesic use can be well-tolerated interventions that reduce pain and disability. Reducing the risk of injurious falls is paramount given the prevalence of osteoporosis. Interventions that may reduce fall risk include minimizing the use of sedative-hypnotic agents, providing training in transfer skills (balance and gait training), and adapting the home environment.

Messinger-Rapport BJ, Thacker HL. Prevention for the older woman, part 6: Mobility: A practical guide to managing osteoarthritis and falls. *Geriatrics* 2003; 58(July):22-29.

Key words: mobility • osteoarthritis • falls • exercise • balance
gait • analgesia • vitamin D • calcium

Changes in functional status due to age and chronic disease can threaten the ability of older women to live independently at home. One measure of whether an older woman needs assistance is deterioration in her ability to perform the instrumental activities of daily living (IADLs, eg, prepare meals, do housework and laundry, take medications, shop for groceries, manage money, and use the telephone). The ability to perform these basic tasks may decline gradually over time, or it may suddenly be lost because of an injury that might have been prevented.

In this article, we discuss the important role physicians play in helping older women function as well as possible by preventing disability from osteoarthritis and injuries from falls. This discussion is the sixth installment of a continuing series in which we have offered a practical guide to preventive care of older women living in the community.¹⁻⁵ Each article has presented decision points in the primary care management of “Mrs. Niece” and “Mrs. Aunt,” two hypothetical but typical patients who have different problems that occur in middle and late life.

Dr. Messinger-Rapport is assistant professor, Case Western Reserve University School of Medicine, Columbus, and staff physician, section of geriatric medicine, The Cleveland Clinic Foundation, Cleveland, OH.

Dr. Thacker is assistant professor of internal medicine, Ohio State University School of Medicine, Columbus, and clinical associate professor of medicine, Penn State College of Medicine, Hershey, PA. She is also section head of women’s health and staff physician, Gault Women’s Health and Breast Pavilion, departments of GIM and OB-GYN, The Cleveland Clinic Foundation, Cleveland, OH.

Disclosure: Dr. Thacker discloses that she serves on the speakers’ bureaus of the Pfizer, Wyeth-Ayerst, Eli Lilly, and Merck corporations.

Patient history

Mrs. Niece, age 65, lives with her husband in a modest home. She spends her time doing housework and gardening, caring for a grandchild, and assisting her aunt. She has been taking estrogen for 20 years, beginning after a hysterectomy, and is taking hydrochlorothiazide for mild hypertension. Mrs. Niece and her husband support themselves on his pension.

Mrs. Aunt, age 85, is a widow living alone in an apartment not far from her niece. Mrs. Aunt does some driving to shop for groceries but prefers to have her niece drive her to doctor appointments. They therefore schedule their visits together. Mrs. Aunt has minimal retirement savings, and her income consists of Social Security.

Mrs. Aunt has a history of hip fracture and suffered a mild ischemic stroke 1 year ago. She has recovered her functional abilities, including the strength on her right side and her speech. A previous work-up suggested that Mrs. Aunt has early-stage dementia, possibly a mixed vascular and Alzheimer’s type. Her physician recently began monitoring for changes in cognition, using the Mini-Mental State Examination at 6- to 12-month intervals.

Osteoarthritis

Mrs. Niece describes herself as being in good health, although her mobility is limited to some extent by knee pain, especially on the right. Osteoarthritis (OA), the most common form of

arthritis, is the likely cause of her joint pain. Nevertheless, the physician evaluating an older woman for OA should not overlook the possibility of other conditions that can contribute to joint pain, such as diffuse idiopathic skeletal hyperostosis, bursitis, avascular necrosis, and inflammatory arthritis such as gout or pseudogout.

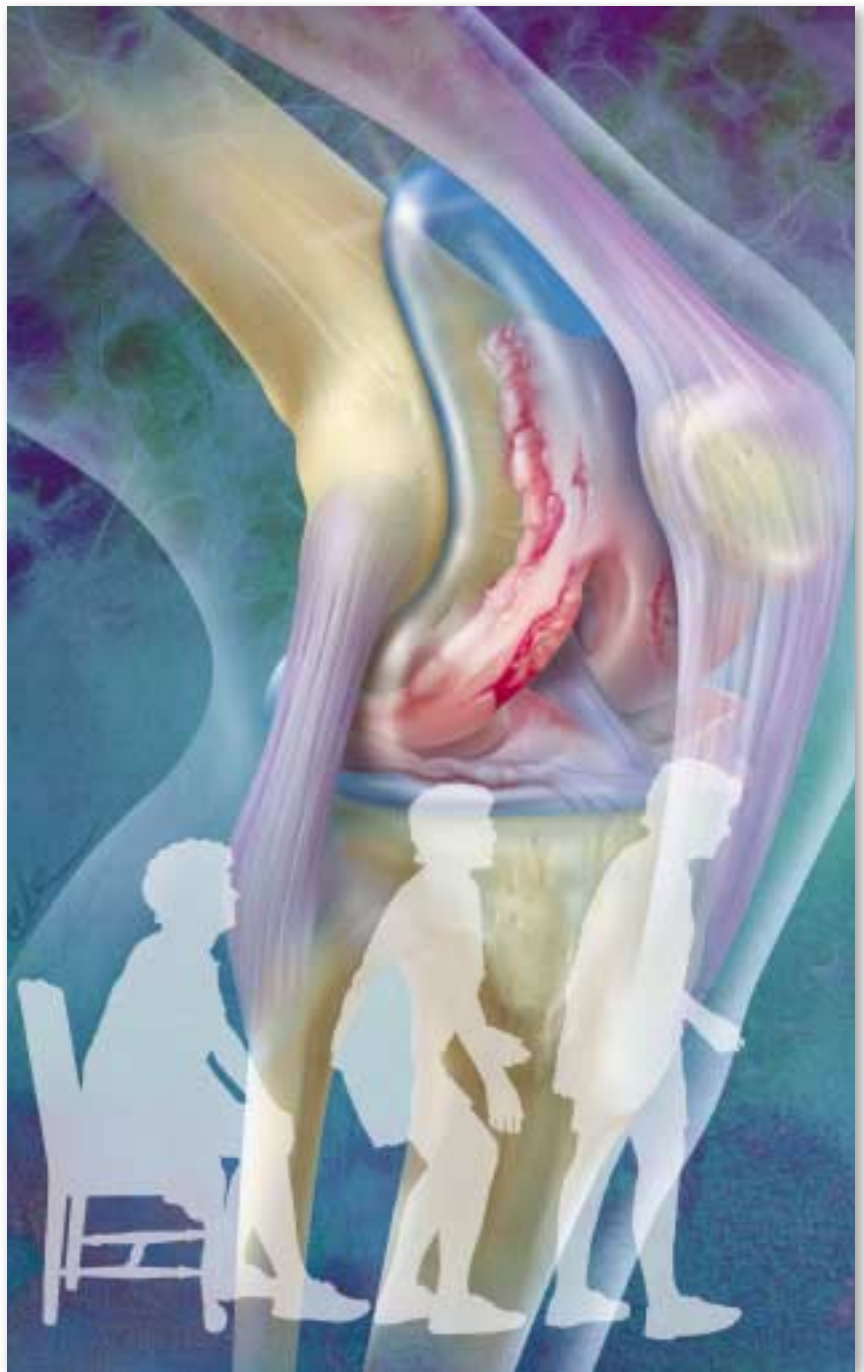
Work-up. Pain, often from OA, is a common complaint of older women both in the community and the nursing home. A comprehensive pain assessment should include a medical history and physical examination, as well as a review of the results from pertinent laboratory and other imaging tests. Characteristics of the pain as well as effectiveness and side effects of current and previously used medications need to be assessed. Pain-associated disabilities in basic and instrumental ADLs should be ascertained. Finally, the physician must assess psychosocial functioning, including mood and dysfunctional relationships.

Exercise. Significantly, older women comprise one of the least physically active populations, along with persons with low levels of education and income. Older women (as well as men) are less likely to participate in leisure physical activity compared with younger persons.

Exercise at moderate levels of training (aerobic and resistance training) has been shown to be effective in clinical trials of older adults in improving generalized and localized pain and functional status. There is no evidence that one type of exercise is better than others. The intensity, frequency, and duration of exercise must be individualized to the needs and preferences of the older woman.

Older women may become more motivated to exercise if their physicians help them understand the benefits. Compared with their sedentary counterparts, older adults who exercise:

- decrease their risk factors for chronic disease, including hyperlipidemia, insulin resistance, and low bone mass



Osteoarthritis pain, including knee pain, is a common complaint among older women. Fear of falling is also a concern for some women. The “get up and go” test shown above can be used to assess gait and balance in an older woman who has fallen.

Illustration for Geriatrics by Christy Krames, M.A., CMI

- decrease risk for falls with balance, gait training, and exercise programs⁶

- have lower rates of physical disability, hip fractures, hospitalizations, and premature death.

Regular exercise is safe and improves measures of fitness such as aerobic power, strength, balance, and flexibil-

ity at any age.⁷ In one study, a small group of 90-year-old female nursing home residents increased quadriceps strength by 174% and walking speed by 48% by participating in a high-intensity weight-resistance training program for 8 weeks.⁸

Some cross-sectional studies of com-

Table 1 Educational exercise materials to help your older patient**Exercise: Feeling fit for life (pamphlet)**

Source: Age Page, National Institute on Aging (www.nia.nih.gov/health/agepages/exercise.htm). Download from Web site, or order up to 150 free copies by calling 1-800-222-2225

Description: Information for older persons on how to make exercise a part of everyday life, including moderate-level activities and safety tips

Exercise (video and 80-page companion booklet)

Source: National Institute on Aging (www.nia.nih.gov/exercisevideo)
Send check or money order for \$7 to NIAIC, Dept. W, P.O. Box 8057, Gaithersburg, MD 20898-8057

Description: 48-minute video that shows how to start and stick with a safe, effective program of stretching, balance, and strength-training exercises; features Margaret Richard, host of PBS exercise program, *Body Electric*

Exercise: The key to the good life (handbook)

Source: The President's Council on Physical Fitness and Sports (PCPFS)

Description: Illustrated handbook on nutrition and exercise for the midlife and older person. Download as pdf file (29 pages) from the Publications/Reading Room on the PCPFS Web site (www.fitness.gov). Click on "Pep up your life: A fitness book for mid-life and older persons."

Source: Prepared for Geriatrics by Barbara J. Messinger-Rapport, MD, PhD, and Holly L. Thacker, MD.

petitive athletes have shown an association between exercise and the radiographic development of OA, such as hip OA among retired football players.⁹ Some of these athletes had a history of significant ligamentous and cartilage injuries, however, which may predispose to OA. Soccer players without knee injury have no greater prevalence of OA than sedentary controls.¹⁰ Also, recreational runners in their 60s do not demonstrate an elevated risk of OA of knee or hip, compared with nonrunners.¹¹

The weight of the evidence, therefore, suggests that clinical outcomes of pain, disability, and general health are better in older adults who remain physically active than in sedentary controls. Risks from moderate-level exercise are low. Regular exercise is well tolerated by persons with OA, and both aerobic and resistance training reduce OA pain and disability. Information on exercise and physical activity for older persons is available from the National Institute on Aging (table 1).

Analgesia. Pain management strategies may include nonpharmacologic and pharmacologic therapies.¹² Treat-

ment begins with a comprehensive assessment of the quality of pain and its impact on physical or psychological function, as well as the quality of life. All women should receive education about how to manage their pain. Exercise, perhaps supervised initially by a physical therapist, should be a part of all arthritis patients' pain management regimens. Other non-pharmacologic interventions may include heat, cold, and massage therapies, acupuncture, plus use of topical analgesic agents. Care should be taken to prevent thermal injury, especially in patients with sensory or cognitive impairment.

In 2002, the American Geriatrics Society updated its clinical practice guideline for the management of persistent pain.¹³ Pharmacologic interventions include acetaminophen, the dose of which should be maximized before moving on to other medications. The guideline recommends selective nonsteroidal anti-inflammatory drugs (NSAIDs; ie, the Cox-2 inhibitors) over the nonselective NSAIDs in those persons requiring long-term daily analgesic therapy. Opioid analgesic drugs are also recommended as being effec-

tive and having fewer long-term risks than other analgesic drug regimens in older persons with persistent pain. Recent studies suggest that opioids, although they may take longer to reach an effective blood level and may take longer to wear off, may provide more potent analgesia in women compared with men.¹⁴ Careful monitoring of adverse side effects such as constipation is important. Not mentioned in the guideline is glucosamine, a nutritional supplement becoming recognized as a pharmacologic intervention for mild to moderate arthritis pain with minimal side effects.¹⁵ Capsaicin cream is also effective in arthritic, as well as other types of pain.¹⁶ See tables 2 and 3 for suggested medications and dosing of opioids and other analgesics.

Table 2 also provides information about calcium and vitamin D requirements because all women who limit their weight-bearing activities as a result of pain may be at risk of osteoporosis complications, including further pain. Adequate calcium and vitamin D supplementation may decrease future osteoporotic complications.

Hormone therapy. Most observational studies, such as the Framingham study,¹⁷ suggest that postmenopausal women on long-term hormone therapy (HT) have a reduced risk of radiographic knee and hip OA. Long-term HT may protect against knee OA by preserving cartilage.¹⁸ Although the Heart and Estrogen/Progestin Replacement Study (HERS) did not demonstrate a difference in knee pain or disability in women begun on HT compared with placebo,¹⁹ there have been no long-term interventional studies with HT designed to evaluate OA as a primary outcome. It would not be justified to begin an older woman on HT specifically for her arthritis given the potential adverse cardiovascular outcomes seen in the HERS trial²⁰ and the Women's Health Initiative (WHI) trial²¹ and the absence of long-term interventional studies of HT. Nevertheless, maintenance of cartilage and decreased knee OA may be one of the several in-

Table 2 Over-the-counter agents commonly used in osteoarthritis*

Medication	Dosage	Comments/precautions
Non-aspirin OTCs		
Acetaminophen (Tylenol, Tylenol ES, Tylenol Arthritis)	Mild OA: 325 mg every 4 to 6 hrs prn Moderate OA: 500 mg; 1 to 2 tablets every 6 hrs prn or RTC Severe OA: 650 mg; 1 to 2 tablets every 8 hrs prn or RTC	May increase INR; more frequent blood tests may be needed with warfarin; may cause hepatic toxicity when used with alcohol. Consider routine rather than prn dosing for moderate-to-severe symptoms.
Capsaicin (Zostrix .025%, Zostrix .075% HP)	Mild, moderate, or severe OA: Zostrix or Zostrix HP 3 to 4 times daily	Apply over affected joint. Regular application needed for pain relief.
Chondroitin	Mild, moderate, or severe OA: 800 to 1,600 mg/d	Regular use needed for pain relief. No increased risk of bleeding. Each reduces pain from knee and hip OA. No extensive data yet available about benefit of chondroitin and glucosamine together compared with individual use.
Glucosamine	Mild, moderate, or severe OA: Begin at 500 mg tid. May reduce to qd or bid after 2 to 4 weeks when pain reduction is achieved	
Selected NSAIDs (OTC or by prescription)		
Ibuprofen (Advil, Motrin IB)	Mild OA: 200 mg bid prn Moderate OA: 200 to 400 mg every 6 hrs prn Severe OA: 600 to 800 mg every 8 hrs prn	Decreases GFR and increases renal complication rate. Also, increased risk of bleeding with advanced age, tobacco use, increased dose, and duration of treatment. Some evidence for gastric protection with concomitant misoprostol use, but therapeutic doses are poorly tolerated in older adults. Higher doses listed here should not be used longer than a few days in older adults.
Naproxen (Aleve, Anaprox, Anaprox DS, Naprosyn,)	Mild OA: 220 mg/d prn Moderate OA: 220 to 250 mg bid prn Severe OA: 500 mg bid prn	
Ketoprofen (Orudis KT, Oruvail)	Mild OA: 12.5 mg tid prn Moderate OA: 25 mg tid prn Severe OA: 50 mg tid prn	Same as above.
Adjunctive treatment		
Calcium with vitamin D	Total intake (diet plus supplement) should contain: Calcium: 1,200 to 1,500 mg daily Vitamin D: 600 to 800 IU daily	Should be taken regularly by all postmenopausal women. TUMS are less expensive and may be substituted if sufficient vitamin D is present in diet. Precautions with hyperparathyroidism, renal stones, renal failure.
<small>RTC: Around the clock INR: International normalized ratio NSAID: Non-steroidal anti-inflammatory drug GFR: Glomerular filtration rate</small>		
<small>*Before prescribing any agent, check for possible Black Box warnings, investigate possible drug-drug interactions, review potential adverse events, and verify dosing recommendations.</small>		
<small>Source: Prepared for Geriatrics by Barbara J. Messinger-Rapport, MD, PhD, and Holly L. Thacker, MD.</small>		

centives, such as higher bone density and fewer hip fractures, to continue with long-term HT (or estrogen therapy as in Mrs. Niece's situation) after several years of use without adverse events and after individual consideration of risks and benefits.

Patient management. To improve joint function, both Mrs. Aunt and Mrs. Niece should be encouraged to exercise to the extent that they are capable. The optimal frequency, intensity, and duration of exercise for older adults is unknown. To avoid the possibility that

increased stress on a damaged joint may exacerbate OA, they should exercise at a moderate level.

Like most older patients, Mrs. Niece and Mrs. Aunt are more likely to adhere to a program of short, frequent episodes of exercise, rather than long,

Table 3 Prescription medications commonly used in osteoarthritis*

Medication	Dosage	Comments/precautions
NSAIDs commonly prescribed for older adults		
Sulindac (Clinoril)	Mild OA: 150 mg/d prn Moderate OA: 150 mg bid prn Severe OA: 200 mg bid prn	Decreases GFR and increases renal complication rate. Also, increased risk of bleeding with advanced age, tobacco use, increased dose, and duration of treatment.
Nabumetone (Relafen)	Mild OA: 500 mg bid prn Moderate OA: 750 mg bid prn Severe OA: 1,000 mg bid prn	Some evidence for gastric protection with concomitant misoprostol use, but therapeutic doses are poorly tolerated in older adults. Higher doses listed here should not be used longer than a few days in older adults.
Diclofenac (Voltaren, Cataflam, or Voltaren-XR)	Mild OA: 25 mg bid prn Moderate OA: 50 mg bid or 100 mg XR prn Severe OA: 50 mg tid or 75 mg bid prn	
Celecoxib (Celebrex)	Mild OA: 100 mg/d prn Moderate or severe OA: 100 mg bid	Celecoxib and valdecoxib are contraindicated in sulfa-allergic individuals.
Rofecoxib (Vioxx)	Mild OA: 12.5 mg/d prn Moderate or severe OA: 25 mg/d prn	The Cox-2 inhibitors celecoxib, rofecoxib, and valdecoxib are associated with significant decrease in gastric toxicity, but not in renal complications.
Valdecoxib (Bextra)	Mild, moderate, or severe OA: 10 mg/d prn	
Analgesics with narcotic properties		
Tramadol (Ultram)	Mild OA: 25 mg qd, bid prn Moderate or severe OA: 50 to 100 mg q 6 to 8 hrs prn or RTC (not to exceed 300 mg/d in older adults)	Non-narcotic with mu opioid receptor binding properties. Can cause psychic and physical dependence of the morphine type. May lower the seizure risk, especially with concomitant use of SSRIs, tricyclic antidepressants or tricyclic compounds, opioids, or neuroleptics.
APAP/Codeine (Tylenol #3)	Mild OA: 1 tablet qd, bid prn Moderate or severe OA: 1 to 2 tablets every 4 to 6 hrs prn or RTC	10% of codeine demethylated to morphine. Maximal dose of combination drugs limited by acetaminophen content. The narcotic can be given separately if a higher narcotic analgesia is needed.
Oxycodone/APAP (Roxicet 5/325, Percocet 5/325)	Mild OA: N/A Moderate or severe OA: 1 to 2 tablets every 4 to 6 hrs prn or RTC	

NSAID: Non-steroidal anti-inflammatory drug GFR: Glomerular filtration rate RTC: Around the clock
SSRI: Selective serotonin reuptake inhibitor

*Before prescribing any agent, check for possible Black Box warnings, investigate possible drug-drug interactions, review potential adverse events, and verify dosing recommendations.

Source: Prepared for Geriatrics by Barbara J. Messinger-Rapport, MD, PhD, and Holly L. Thacker, MD.

less frequent episodes. The benefits of each type of program are comparable.

Mrs. Niece should be encouraged to join an exercise group, for instance, a walking group three times weekly, for her mild-to-moderate knee pain. Acetaminophen (Tylenol ES or Tylenol Arthritis) once or twice daily, particu-

larly prior to exercise, may increase exercise tolerance. Glucosamine (500 to 1,500 mg/d), chondroitin (800 to 1,600 mg/d), or both may reduce long-term pain. Adding topical capsaicin may modulate the pain as well. Short-term occasional nonselective NSAID use is also acceptable. Should regular NSAID

use be necessary, a Cox-2 inhibitor should be considered, with appropriate monitoring of Mrs. Niece's creatinine level given her concomitant diuretic usage. Although there is no evidence supporting initiation of HT for her arthritis, knowing the observational evidence supporting benefit of

long-term HT use in arthritis may help Mrs. Niece decide to continue her HT.

Falls

Mrs. Aunt fell and broke her hip 1 year ago and underwent open reduction and internal fixation. Through rehabilitation, she has regained the ability to walk without a cane or other assistive device but is fearful of falling again. As a result, she has reduced her social activities to family gatherings and attending church.

Injuries related to falls account for approximately 5% of all hospitalizations in persons age ≥ 65 . Fractures occur in 4 to 6% of falls, and one-fourth of those are hip fractures.²²

Because of the morbidity and mortality associated with falls, the American Geriatrics Society issued guidelines in May of 2001 recommending that physicians assess risk factors for falls in each of their patients in order to offer effective intervention.²³ These guidelines are summarized on the Web at www.americangeriatrics.org/products/positionpapers/abstract.shtml. Each patient should be asked if she has fallen since the last visit. Those who present with one fall can be evaluated in the office with a balance and gait screening, such as the “get up and go” test. Women with recurrent falls require a comprehensive assessment of vision, strength, gait, balance, orthostasis, cardiovascular and neurologic function, and cognition. The physician could then offer appropriate intervention, referral, or both to decrease the future risk of falls.

In the “get up and go” test, the patient rises from a straight-backed chair without using armrests if possible. She is asked to walk forward approximately 10 feet, turn around, and return to the chair. Abnormalities of gait and balance to be identified during the test include:

- unsafe or incomplete transfers
- poor sitting balance
- difficulty rising
- difficulty or unsafe sitting down
- instability on standing or turning
- short, discontinuous steps

- undue hesitancy and slowness
- excessive truncal sway
- grabbing for support or stumbling.

The patient’s gait is considered severely abnormal if she appears at risk for a fall at any time during the test. Although there are no established norms, timing the “get up and go” test allows for serial comparisons. Identifying abnormalities of gait and balance may be helpful in predicting recurrent falls and may also offer targets for rehabilitation.

Interventions may reduce the risk of falls, as demonstrated by the multicenter NIA-funded Frailty and Injuries, Cooperative Studies of Intervention Techniques (FICSIT) from Yale University School of Medicine. At-risk patients age ≥ 70 in an intervention group received behavioral instructions for postural hypotension, adjustments in the dosage of sedative-hypnotic agents, training in transfer skills, environmental alterations for safety, and exercise training. Their risk of falling was reduced by nearly one-third (adjusted incidence-rate ratio of falling, 0.69 [CI 0.52 to 0.9]), compared with a control group that received no interventions.²⁴

Interventions to reduce the injury associated with falls are important in protecting older women. All women should have adequate supplementation with calcium and vitamin D (table 2). Evaluation for osteoporosis should be conducted and, when diagnosed, treated pharmacologically with antiresorptive agents. Additionally, the risk of hip fracture can be reduced by more than 50% in frail older adults who use an anatomically designed external hip protector.²⁵ Unfortunately, hip protectors are expensive, seldom covered by insurance, and may be cosmetically unappealing, leading to non-compliance with recommendations.


Patient management. It is appropriate to routinely ask older women such as Mrs. Niece and Mrs. Aunt if they have experienced any falls since their last visit. Counseling, when appropriate, should cover how to prevent falls by recognizing and reducing risk factors.²⁶ The pa-

tient handout, “Fall risk in the older adult,” found on www.geri.com, provides information about how patients and families can prevent falls. Specialty referral may be appropriate (eg, occupational or physical therapy for mobility disorders, urology for incontinence, podiatry for foot problems, audiology for a hearing assessment, ophthalmology for visual loss, etc.). Mrs. Aunt was referred to physical therapy to assess her gait and balance. After approximately 6 weeks of two training sessions weekly, she was able to walk with less fear and a more confident stride. She was given a toll-free number and a commercial web site address to order a hip pad protector. She checked with her insurance carrier and found that it would not cover the nearly \$100 expense and she decided to defer the purchase.

Summary

In this section, we have guided Mrs. Niece and Mrs. Aunt through different mobility needs—dealing with arthritis pain and reducing injurious falls. A common thread in maintaining mobility is psychosocial assessment and monitoring. A good psychosocial support basis will help Mrs. Niece manage her arthritis and encourage Mrs. Aunt to achieve her potential in terms of gait training.

Coming next

In a future issue of *Geriatrics*, these authors will discuss safety issues—including neglect, abuse, and driving—in the seventh installment of this *Prevention for the Older Woman* series. 

Email this article to a friend.
Log on to www.geri.com
Always on call.



References

1. Messenger-Rapport BJ, Thacker HL. Prevention for the older woman, part 1: A practical guide to assessing physical and cognitive function. *Geriatrics* 2001; 56(July):24-35.

2. Messinger-Rapport BJ, Thacker HL. Prevention for the older woman, part 2: A practical guide to hormone replacement therapy and urogynecologic health. *Geriatrics* 2001; 56(Sept):32-42.
3. Messinger-Rapport BJ, Thacker HL. Prevention for the older woman, part 3: A practical guide to prevention and treatment of osteoporosis. *Geriatrics* 2002; 57(April):16-27.
4. Messinger-Rapport BJ, Thacker HL. Prevention for the older woman, part 4: A practical guide to managing cardiovascular disease. *Geriatrics* 2002; 57(July):22-30.
5. Messinger-Rapport BJ, Thacker HL. Prevention for the older woman, part 5: A practical guide to managing risk of malignancies. *Geriatrics* 2002; 57(Oct):42-9.
6. Tinetti ME. Clinical practice. Preventing falls in elderly persons. *N Engl J Med* 2003; 348(1):42-9.
7. Ettinger WH Jr. Physical activity and older people: A walk a day keeps the doctor away (editorial). *J Am Geriatr Soc* 1996; 44(2):207-8.
8. Fiatarone MA, Marks EC, Ryan ND, Meredith CN, Lipsitz LA, Evans WJ. High-intensity strength training in nonagenarians. Effects on skeletal muscle. *JAMA* 1990; 263(22):3029-34.
9. Klunder KB, Rud B, Hansen J. Osteoarthritis of the hip and knee joint in retired football players. *Acta Orthop Scand* 1980; 51(6):925-7.
10. Roos H, Lindberg H, Gardsell P, Lohmander LS, Wingstrand H. The prevalence of gonarthrosis and its relation to meniscectomy in former soccer players. *Am J Sports Med* 1994; 22(2):219-22.
11. Lane NE, Michel B, Bjorkengren A, et al. The risk of osteoarthritis with running and aging: A 5-year longitudinal study. *J Rheumatol* 1993; 20(3):461-8.
12. Felson DT, Lawrence RC, Hochberg MC, et al. Osteoarthritis: New insights. Part 2: Treatment approaches. *Ann Intern Med* 2000; 133(9):726-37.
13. AGS Panel on Persistent Pain in Older Persons. The management of persistent pain in older persons. *J Am Geriatr Soc* 2002; 50(6 Suppl):S205-24.
14. Sarton E, Olofsen E, Romberg R, et al. Sex differences in morphine analgesia: An experimental study in healthy volunteers. *Anesthesiology* 2000; 93(5):1245-54; discussion 6A.
15. Towheed TE, Anastassiades TP, Shea B, Houpt J, Welch V, Hochberg MC. Glucosamine therapy for treating osteoarthritis. *Cochrane Database Syst Rev* 2001; (1):CD002946.
16. Zhang WY, Li Wan Po A. The effectiveness of topically applied capsaicin. A meta-analysis. *Eur J Clin Pharmacol* 1994; 46(6):517-22.
17. Zhang Y, McAlindon TE, Hannan MT, et al. Estrogen replacement therapy and worsening of radiographic knee osteoarthritis: The Framingham Study. *Arthritis Rheum* 1998; 41(10):1867-73.
18. Wluka AE, Davis SR, Bailey M, Stuckey SL, Cicuttini FM. Users of oestrogen replacement therapy have more knee cartilage than non-users. *Ann Rheum Dis* 2001; 60(4):332-6.
19. Nevitt MC, Felson DT, Williams EN, Grady D. The effect of estrogen plus progestin on knee symptoms and related disability in postmenopausal women: The Heart and Estrogen/Progestin Replacement Study (HERS), a randomized, double-blind, placebo-controlled trial. *Arthritis Rheum* 2001; 44(4):811-8.
20. Hulley S, Grady D, Bush T, et al. Randomized trial of estrogen plus progestin for secondary prevention of coronary heart disease in postmenopausal women. Heart and Estrogen/Progestin Replacement Study (HERS) Research Group. *JAMA* 1998; 280(7):605-13.
21. Rossouw JE, Anderson GL, Prentice RL, et al; Writing Group for the Women's Health Initiative Investigators. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: Principal results from the Women's Health Initiative randomized controlled trial. *JAMA* 2002; 288(3):321-33.
22. King MB, Tinetti ME. Falls in community-dwelling older persons. *J Am Geriatr Soc* 1995; 43(10):1146-54.
23. Guideline for the prevention of falls in older persons. American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention. *J Am Geriatr Soc* 2001; 49(5):664-72.
24. Tinetti ME, Baker DI, McAvay G, et al. A multifactorial intervention to reduce the risk of falling among elderly people living in the community. *N Engl J Med* 1994; 331(13):821-7.
25. Kannus P, Parkkari J, Niemi S, et al. Prevention of hip fracture in elderly people with use of a hip protector. *N Engl J Med* 2000; 343(21):1506-13.
26. Tibbitts GM. Patients who fall: How to predict and prevent injuries. *Geriatrics* 1996; 51(Sept):24-31.

**STAY IN TOUCH...
WITH US!**



**Begin a subscription or
renew an existing one.**

It's fast & easy.



Click the "How to Subscribe" link on the left, and follow the user-friendly instructions.

**Please enter this priority code
when prompted: GERIHS03.**

Geriatrics
Medicine for Adults and Beyond

- Peer reviewed, evidence-based clinical articles & departments plus news and abstracts
- Referenced in Index Medicus and Current Contents
- Monthly CME articles provide one AMA Category 1 credit (CME accredited through Mt Sinai School of Medicine)