(<20%) of fracture risk reduction on therapy[20] and that most women will have a reduced risk from medication even if their BMD does not increase.[19] They also maintain that evidence of using serial BMD testing to identify secondary causes of osteoporosis is only anecdotal.[65] The coalition's clinical recommendations do not take a position on this debate. Recommendation #12 provides additional information about length of pharmacological treatment.

Additional Recommendations and Rationales

Recommendation 8: Consider referring people aged 65 years or older with a hip or vertebral fracture who have possible or presumed secondary causes of osteoporosis to the appropriate subspecialist for further evaluation and management.

Many postmenopausal women, as well as men, with osteoporosis have factors such as underlying disease or medication use that can contribute to bone weakening.[20,64,65,97–102] Glucocorticoids are probably the most common cause of secondary osteoporosis, but other medications, including proton pump inhibitors, selective serotonin reuptake inhibitors, barbiturates, aromatase inhibitors, loop diuretics, and anticoagulants, among others, have been associated with secondary osteoporosis.[97–99] Medical conditions causing osteoporosis include endocrine disorders (eg, diabetes mellitus, hyperthyroidism, hyperparathyroidism), kidney and liver disease, malabsorption syndromes, and autoimmune disorders, among others.[20,97,99]

Theoretically, identifying and addressing these factors could reduce the risk of secondary fracture.[97,100] There is little agreement on the best approach, however, and evidence of the clinical utility of most testing is not available.[92,93] Clinicians nevertheless need to consider the possibility of secondary causes of osteoporosis, conduct an appropriate history and medical examination, and consider referring patients with possible secondary causes to appropriate subspecialists.[5,20,65]

Virtually all published clinical guidelines relating to fractures or osteoporosis include recommendations not to use tobacco and to limit alcohol intake because of these substances' impact on bone health. Although tobacco use is discouraged in any amount, the recommended upper limits on alcohol intake affecting bone health vary. The consensus recommendation follows CDC definitions of excessive and heavy drinking: for women, 8 or more drinks per week; for men, 15 or more drinks per week.[103]

Recommendation 9: Counsel people aged 65 years or older with a hip or vertebral fracture:

- Not to smoke or use tobacco;
- To limit any alcohol intake to a maximum of 2 drinks a day for men and 1 drink a day for women; and
- To exercise regularly (at least three times a week), including weight-bearing, muscle strengthening, and balance and postural exercises, depending on their needs and capabilities, preferably supervised by physical therapists or other qualified professionals.

Clinical guidelines are also united with respect to the importance of recommending exercise for patients with osteoporosis.[104] Regular weight-bearing and strength-training exercise can lead to improvements in bone mineral density and also decrease the risk of falls.[105–109] Exercises that focus on balance and trunk muscle strength may be even more effective at preventing falls.[20] Exercise recommendations must be tailored to the individual patient, considering their needs, limitations, and preferences, among other factors, including safety.[21,61] For example, activities that involve forward spine flexion and rotation, side bending, or heavy weights should be approached cautiously because they generate compressive and torsional forces on vertebrae that can result in fracture.[20,61]

Although available clinical guidelines are well aligned in terms of types of exercise they advise, they often do not include information about exercise dosage, progression, or contraindications.[104] Thus, physicians should strongly consider referring people aged 65 years or older with hip or vertebral fractures to physical therapists or other qualified professionals for evaluation and exercise plan development.

For patients to make an educated and informed decision about taking anti-osteoporosis medications, they need to understand the risks and benefits of their choices. The prescribing physician needs to take steps to ensure that patients fully understand this material. Guidelines promulgated by the American Association of Clinical Endocrinologists and the American College of Endocrinology[20] discuss osteoporosis risk communication strategies and provide examples of effective presentations, and educational materials are available from other organizations as well.

Recommendation 10: When offering pharmacologic therapy for osteoporosis to people aged 65 years or older with a hip or vertebral fracture, discuss the benefits and risks of therapy, including, among other things:

- The risk of osteoporosis-related fractures without pharmacologic therapy; and
- For bisphosphonates and denosumab, the risk of atypical femoral fractures (AFFs) and ONJ and how to recognize potential warning signs.

One of the most important aspects of this recommendation is that patients understand the full extent of risks they face without drug treatment of their osteoporosis. The risk of another broken bone is substantially increased—Medicare patients who had a first fracture of the hip or spine had a 20% to 25% chance of a subsequent fracture just within the first year.[3] Consequences of second fractures may include loss of independence, the loss of mobility, and increased mortality. Although a full review of how different anti-osteoporosis pharmacologic treatments can reduce these outcomes is beyond the scope of this document, a brief review of evidence concerning bisphosphonates is appropriate because inaccurate perceptions of their benefits and risks are often substantial barriers to appropriate treatment and fracture prevention. Information about a range of available treatments can be found in review articles, such as that by Tu and colleagues.[110]

A recent systematic review and meta-analysis examined the effects of bisphosphonates in the specific context of secondary fracture prevention.[111] The analysis included 5670 participants with osteoporotic fractures from 12 randomized controlled trials with follow-up ranging from 1 month to 3 years. Compared with