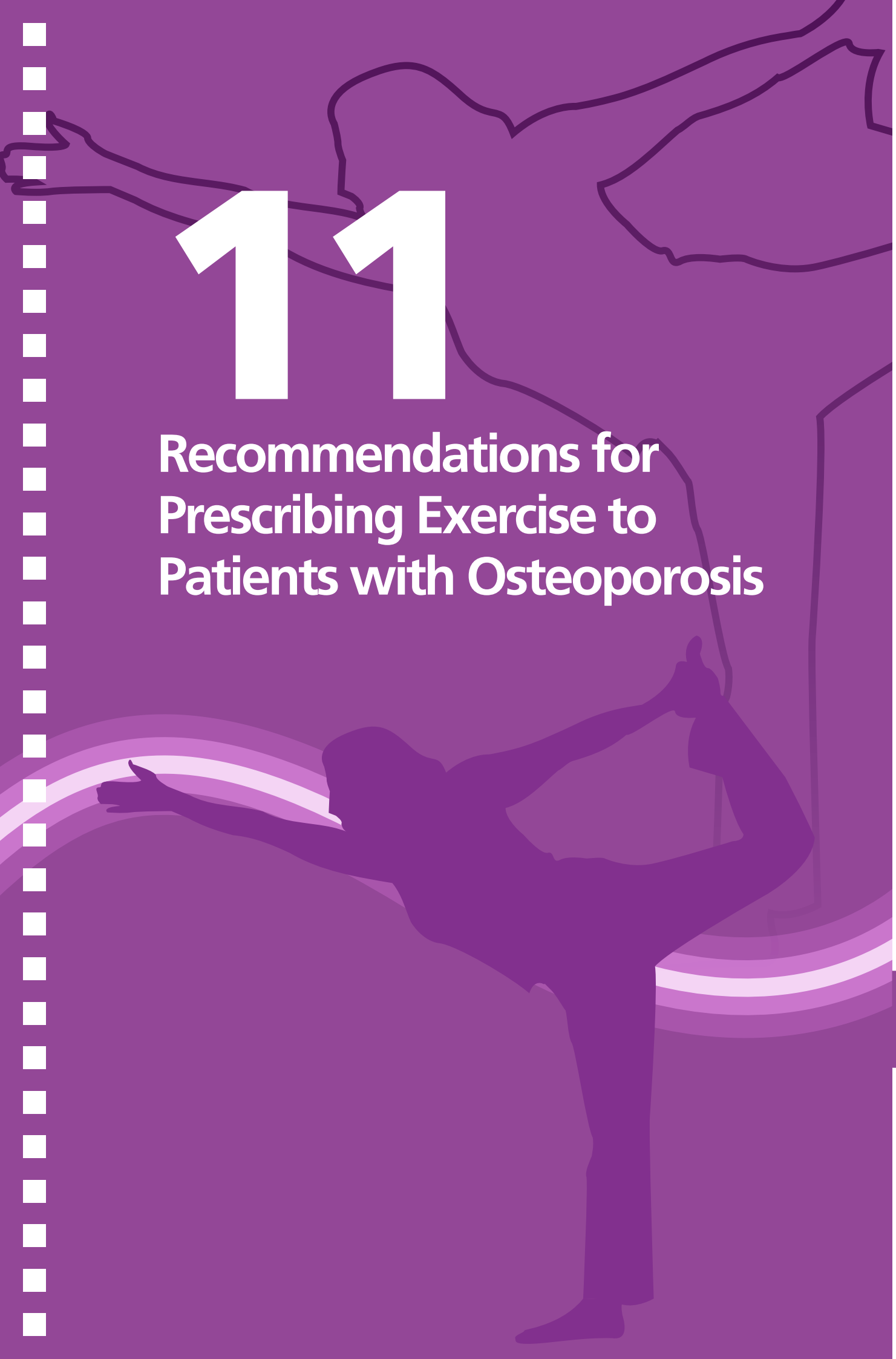
11

Recommendations for Prescribing Exercise to Patients with Osteoporosis



11 Recommendations for Prescribing Exercise to Patients with Osteoporosis

Effects of Exercise

Weight-bearing aerobic exercises and muscle-strengthening exercises have been shown to be an integral part of osteoporosis prevention, as well as a part of the treatment process (1).

There is strong evidence that physical activity early in life contributes to higher peak bone mass. Physical activity during early age was more strongly associated with higher bone mineral density (BMD) at all sites than was physical activity in the past two years (2). Lifetime weight-bearing is more strongly associated with higher BMD of the total and peripheral skeleton than is non-weight-bearing exercise (2). Exercise during the later years in the presence of adequate calcium and vitamin D probably has a modest effect on slowing the decline in BMD (3). Physical activity, particularly weight-bearing exercise, is thought to provide the mechanical stimuli or "loading" important for the maintenance and improvement of bone health (1). A number of systematic reviews and meta-analyses have suggested that an exercise programme combining low impact weight bearing exercise and high-intensity resistance training maintains bone density in men and postmenopausal women (4-6). Resistance training may have more profound site-specific effect than aerobic exercise (7). High-intensity resistance training may have added benefits for decreasing osteoporosis risks by improving strength and balance, and increasing muscle mass (7).

Although patients with osteoporosis may think exercise increases the risk of injury from broken bones, the truth is quite the opposite. A regular and properly designed exercise programme may help to prevent falls and fall-related osteoporotic fractures, which in turn reduces the risk of disability and premature death among patients with osteoporosis. Randomised clinical trials have shown exercise to decrease the risk of falls by approximately 25% (8-10). Stronger back extensor muscles have been shown to decrease the risk of vertebral fractures independent of pharmacotherapy (8-10).

Recommendations for Exercise Prescription

All three components of an exercise program are needed for strong bone health: weight-bearing aerobic exercise such as jogging, brisk walking, stair climbing; muscle strengthening exercise with weights; and balance training such as Tai Chi. Patients should be encouraged and offered assistance in developing a lifetime programme of exercise that they will continue to do and enjoy.

The following table summarises the salient points of the FITT framework for patients with osteoporosis:

	Recommendations*
Frequency	• To perform at least 3 days per week of aerobic exercise (11). • To perform resistance exercise 2 to 3 nonconsecutive days per week (11).
Intensity	• To perform moderate intensity for weight-bearing aerobic exercise (11). • To perform moderate intensity for resistance exercises in terms of bone-loading forces, although some individuals may be able to tolerate more intense training (11). Individuals at risk of osteoporosis are recommended to perform high-intensity training (80-90% 1-repetition maximum for 5 to 6 repetitions) to help preserve bone health (11).
Time	• Initial goal of 20-30 mins per session of moderate-intensity aerobic activity is reasonable, with a goal of progressing to a total of 150 mins per week. In case of extreme reconditioning, a shorter duration at the beginning should be employed (12). • Perform at least 1 set of resistance exercise involving 8 to 10 repetitions per exercise at moderate intensity (11).
Type	• Weight-bearing aerobic exercise includes stair-climbing/ descending, walking with intermittent jogging and table-tennis. • Resistance training of a high intensity produces gains in strength and BMD. Any form of resistance training should be site specific i.e. targeting areas such as the muscle groups around the hip, the quadriceps, dorsi/plantar flexors, rhomboids, wrist extensors and back extensors (13). Certain types of movements should be avoided (refer to the section "Special Considerations" below) • For older women and men at increased risk for falls, the exercise prescription should also include activities that improve balance.

* As many patients may present with comorbidities, it may be necessary to tailor the exercise prescription accordingly.

To be effective, all exercise programmes need to be progressive in terms of impact and intensity as fitness and strength levels improve. Programmes should begin at a low level that is comfortable for the patient. It would be the best if an initial assessment by a suitably trained individual such as a physiotherapist could be done for giving the patient a reference point from which to start the exercise programme.

Special Considerations

- Because the majority of individuals with osteoporosis are older in age and sedentary, they are usually considered as moderate to high risk for atherosclerotic disease. Based on this, it would be prudent to assess the patient before participating in exercise of level higher than usual (12). For resistance training involving use of weight-lifting machines, initial training sessions should be supervised and monitored by personnel who are sensitive to special needs of older adults.

- There are currently no established guidelines regarding contraindications for exercise for people with osteoporosis. The general recommendation is to prescribe moderate intensity exercise that does not cause or exacerbate pain.

- Exercises that involve explosive movements or high-impact loading should be avoided. Low impact weight-bearing activity is characterised by always having one foot on the floor. Ballistic movements or jumping (both feet off floor) is termed high impact training. (11-13)

- Exercises that cause twisting (e.g. golf swing), bending or compression of the spine (e.g. rowing or other dynamic abdominal exercises including sit-ups) should also be avoided. (11-12)

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