

Q&A – June 25, 2014 Presentation: Are you too fit to fracture?

1. Aquafit - I attend a.f. twice a week for 1 hr. We do about 20 mins. of cardio i.e. jumping jacks is that considered ok to do?

Jumping jacks would be considered vigorous aerobic physical activity that also involves moderate-to-high impact. Being in the pool may reduce the impact, but they would still require vigorous effort (e.g., you could not carry on a conversation while doing them). They would not be recommended for someone at high risk of fracture, such as someone with an osteoporotic vertebral fracture, or otherwise considered high risk because of bone mineral density and/or other risk factors. For someone who is at low risk of fracture, and has no other contraindications to vigorous exercise (such as uncontrolled high blood pressure or chest pain), jumping jacks are probably safe to do. For someone at moderate risk of fracture, it may be okay to do them in the pool, particularly if there is no history of fracture or other risk factors, or other contraindications to vigorous exercise. It is hard to know if jumping jacks outside of the pool, or if moderate-to-high impact activities in general are safe for individuals at moderate risk of fracture. It might depend on the person's risk profile, their activity history, and whether they are taking osteoporosis medication. Therefore, if someone at moderate risk of fracture wishes to engage in plyometrics outside of the pool, it would be advisable to consult a physiotherapist or kinesiologist who is Bone Fit trained.

2. Hello,

I have low back problems due to a disc problem and extension and flexion exercises are recommended. But I heard that flexion exercises are not recommended for osteoporosis which I have. What do you suggest?

Exercises with the goal of increasing spinal range of motion can be performed with a few precautions. Movements that require trunk forward flexion (rotating about the hips or spine) can be performed with some of the body's weight supported by upper extremities (e.g., on all fours). Ideally, the movements are limited to mid-range (but not end-range) spine flexion/extension (i.e., flex and extend but not all the way to the end of the range of motion), particularly for individuals at high risk of fracture or if there is a history of spine fracture.

3. Power Training? Did the literature provide any insight into the role / safety of power training? Increasingly the importance of power training as we age is being identified; particularly for functional tasks. But this requires an element of speed in movements. Would power training be contraindicated if low bone mass is present?

Power refers to the amount of work performed per unit time, so power training involves training your body to perform increasing amounts of work in the shortest period of time.

The risks would be associated with the amount of weight used, the type of movement (i.e., if it involves flexion or twisting of the spine) or whether fall risk was increased. Individuals with a history of spine fracture or at high risk of future fracture should emphasize strength training over power training, as alignment and controlled movements are more important than the amount of work performed per unit time. Power training is not contraindicated for those at moderate risk of fracture provided that precautions are taken such that exercises that involve rapid, repetitive, weighted or end-range (i.e., moving to the end of a range of motion) forward bending of the spine or twisting of the spine are modified or avoided, and exercises and resistance levels are chosen carefully and performed with good form. So for example, if a power squat is being performed, one might consider avoiding heavy weighted squats, and ensuring that they are performed with a neutral spine. It may be wise to also avoid exercises that are very high-impact, such as high drop jumps, or other high-impact plyometrics, even if they are not weighted. It would not be wise for someone who is a novice with respect to resistance training to begin power training. The person interested in performing power training should first learn how to perform the exercises at a controlled, standard speed (e.g., 2 seconds lift, 4 seconds lower), then progress towards increasing the speed of the movement without increasing weight, then gradually progress the number of reps and sets, and then add weight if necessary. Precautions to reduce fall risk (e.g., uncluttered spaces, shoes with good traction) are advisable. That said, strength training with an emphasis on functional movements would probably be an adequate challenge for the majority of individuals with osteoporosis; whether power training would provide an advantage over strength training for individuals with osteoporosis is unknown. It might be an interesting method of progression in lieu of increasing weight for someone who has been strength training for a long period and needs a new challenge, but does not want to increase the amount of weight/resistance they are using. Individuals with osteoporosis who are interested in introducing power training are advised to consult a physical therapist or kinesiologist who has Bone Fit training.

4. Strength Training: I do several core fit classes each week as well as yoga. The core fit classes incorporate weight, balance and abdominal exercises. Do I need to include more strength training to my fitness routine?

It is hard to know what is meant by “weight” exercises. Ideally, twice a week you are performing exercises that require each of the major muscle groups (e.g., muscles of chest, arms, upper and lower back, lower leg muscles, upper leg muscles, shoulder muscles) to work against resistance, and that you are progressively increasing the challenge over time. Also, sometimes the focus of classes is muscular endurance, but as we age we lose muscular strength, so it would be advisable to work at an intensity that will build strength. What that means in practice is that you want to choose an exercise where it is challenging to perform 8-12 repetitions – if you can do 15, or even 20, you might need to increase the challenge. As you become stronger, you can emphasize the lower end of the range for the number of repetitions; choose a resistance that you can only perform 8 repetitions before reaching fatigue.

5. Could you comment on Curves machines if you are familiar with them. Lots of older adults go there. What about Zumba?

Although Curves provides a unique way to participate in resistance training, it may not be ideal for individuals with osteoporosis. Moving between exercises quickly, at the expense of good form, is not advisable. The machines may not be adjustable so that they are the right fit for you. If they are performed without adjustment, you may compromise the safety and effectiveness of the movement. Also, the process of adjusting the machines, if they are adjustable, may involve forward bending or twisting of the spine, so individuals at risk of fracture should avoid any exercise machines that are difficult to get in and out of safely or require forward bending or twisting of the spine to adjust. Individuals with osteoporosis should consider modifying or avoiding exercises that involve rapid, repetitive, weighted or end-range forward bending or twisting of the spine, and exercises that involve overhead lifting.

Several of the machines one might find at Curves (e.g., ab/back, overhead press, and possibly others) involve these types of movements, and should not be performed in individuals who are at risk of spine fracture. Also, sometimes jumping, plyometric or step-aerobic type movements are incorporated, which may involve high impact, and may need to be modified. For example, if step ups are being performed, one might want to use a lower step height if they are at moderate or high risk of fracture.

Finally, the level of training that a person who is providing instruction at any gym may vary considerably, and one should not assume that all trainers have knowledge of osteoporosis or how to modify exercise safely. If you really like Curves, have a Bone Fit trained physiotherapist or Kinesiologist assess whether you can do it safely, and provide advice which exercises to do and which to avoid, and teach you how to get in and out and adjust equipment safely. Based on all of the above, however, it would likely be more effective and safe to perform resistance exercises designed to achieve your personal goals, and performed at a pace that allows you to focus on form and body alignment.

Zumba is a fun way to meet your weekly quota of 150 minutes per week or more of moderate or vigorous intensity physical activity. Individuals at moderate risk of fracture should modify or avoid Zumba movements that require rapid, repetitive, weighted or end-range forward bending or twisting of the spine. So for example, if a Zumba movement requires you to twist to the side, you could consider a “step to turn” movement instead, where you step with your foot and turn to face the direction you wish to go, rather than turning only your upper body. Individuals at high risk of fracture might consider choosing classes designed for older adults with osteoporosis, rather than going to general exercise classes.

6. Benefits of Nordic Walking

There are very few clinical trials of Nordic Walking related to bone health, so unfortunately I cannot provide statements about concrete benefits or risks. Nordic Walking is an example of a moderate or vigorous intensity aerobic physical activity that would have general health benefits. For someone at high risk of fracture, I might be concerned that vigorous Nordic Walking would apply a twisting torque on the spine, so limiting the intensity to moderate (e.g., where you can still carry on a conversation, but you are breathing harder than usual) would be advisable. But this statement is speculative and not based on any evidence.

- 7. yoga & bodyflow - I'm 58, diagnosed 3 yrs ago; I've always been an active person...with normal lapses in inactivity during busy or stressful times...however I've been consistently active for the past 1.5 yrs doing Yoga & Bodyflow classes 2 to 3 x's a wk...combined with walking, dancing, biking, gardening for extra aerobic fitness. My question is about Yoga poses...should I be careful with certain postures like various bridge poses where the spine is stretched in reverse? Or will these actually strengthen my spine?**

Yoga or Pilates postures that require trunk or spine forward flexion (rotating about the hips or spine) or twisting to end-range, particularly in sitting or standing, should be avoided, or modified. To maintain mobility in the spine, slow, controlled twisting in while lying on your back or side-lying is acceptable, as is mid-range (but not end-range) spine flexion/extension with some weight supported by upper extremities (e.g., on all fours). There are case reports of spine fractures that may have resulted from yoga flexion postures in individuals with low bone mass. You asked specifically about spinal extension postures “in reverse” which I interpret to mean extension to the end of the range of motion, or backward bending as far as is possible. These postures could result in a fracture to the posterior part of the vertebrae, and I would not recommend them for any individuals with osteoporosis or who are at moderate or high risk of fracture. Backward bending to mid-range (e.g., not all the way backward, such as what is done in the sun salutation where you stand and raise your arms and do a slight backbend) is acceptable.

- 8. Sit ups - partial up with slow back down?**

I do not advocate sit ups for anyone. There are exercises, such as planks or side planks that are more effective and less risky. Curl ups are acceptable for individuals at low risk of fracture, but also not necessary. To increase the challenge, do a plank-to-push-up move. They are really hard!

- 9. Golf and Bone Sparing - I am 60 years old and am at low risk for a fracture. At the urging of a friend, I have recently started playing golf. Obviously, I'm**

not very good at it, and indifferent as to where I should pursue it. Would it be prudent to practice "bone sparing" here and find another leisure activity?

If you are at low risk of fracture, golf is probably safe for you to do, provided there are no other risk factors or conditions present that might make it unsafe. You could consider adopting spine sparing strategies where possible, e.g., modified golfer's reach when bending to pick up the ball. If you are concerned, consult a Bone Fit trained physiotherapist or occupational therapist on how to golf safely.

10. Exercise after wrist and ankle fractures -- I am a group fitness instructor who teaches a class for those who have LBD (low bone density). I have two participants who have had wrist and ankle fractures. Would these types of fractures place these participants in the high risk group for exercise? Should these two women be doing different type of movements than others in class who are at no risk or moderate risk?

Whether someone is high risk depends on their age, gender, bone mineral density, use of glucocorticoids, risk factors and fracture history, and I do not have enough information to make that determination. A spine fracture or a hip fracture would place someone at high risk of future fracture. A history of an osteoporotic wrist fracture would move them up one category – so if based on their age, gender and other risk factors they were moderate risk, a history of a wrist fracture would bump them to high risk, but if they were low risk based on their age, gender and other risk factors, it would bump them to moderate risk. Ankle fractures may or may not be osteoporotic fractures – depends on the context in which they occurred.

11. Can you recommend a good video with resistant training exercises?

No. The reason I avoid recommending any one program is that there is no one program that is a good fit for all users. Some might be great for a novice who is low or moderate risk, but not enough of a challenge for someone who is active, or not safe for someone who is high risk. Also, that video might be sufficient for a few weeks or months, but soon you will need to progress the challenge to see further results. Rather, find a video you like that incorporates resistance training (and ideally balance challenges too), that is a sufficient challenge (after 8-12 reps of each exercise you reach fatigue), and that doesn't include or allows you to modify activities that involve rapid, repetitive, weighted or end-range forward bending or twisting of the spine. Once you have done it for a while, you will need to increase the challenge of the exercises you are doing in that video OR find a new video. Alternatively, invest in consultations with Bone Fit trained

physiotherapist or kinesiologist – perhaps 1-3 consultations to start, and one additional consultation every 3-6 months to progress your exercise program.

12. Clinical Trial - I live in Vancouver. I fit the criteria. What is the contact info for the trial?

prohealthclinical@gmail.com OR contact me directly - Lora Giangregorio 519 888 4567 x36357.

13. Exercises - where do I find info on on going exercise classes in Toronto

Use the Bone Fit locator at www.bonefit.ca or contact Osteoporosis Canada's volunteer hotline.

14. Strength training for bone health -- Hi, When you say you need to train for "strength" for resistance exercises to be effective, how much resistance are you referring to? In terms of % of body weight?

Rather than using a % of body weight, select a weight that you think will allow you to do 10 repetitions with good form. Then do as many as you can with good form – stop if you are moving other parts of your body to keep going, if you are straining to lift it, or if you have to alter your body's alignment. If you can do more than 12, the weight is too light. If you can do less than 8 the weight is too heavy. Do this for all the exercises you are doing.

15. Are the slides available? I would like to print them out as a guide to planning exercise.

The slides are not available, but we would like to make selected slides available online for you to print, and there are plans to develop and post tools for exercise planning on Osteoporosis Canada's website. We have also developed an exercise booklet that will hopefully be available online by the end of the year. Let the organizers know what you need! We are also going out to various regions in Ontario to consult patients about what they need – if you would like to participate, please contact me: lora.giangregorio@uwaterloo.ca or 519 888 4567 x36357.

16. Yoga Instructors - Is the Bone Fit instructors training primarily geared for aerobics instructors or is it also geared for yoga instructors

Yoga instructors that meet the criteria for Bone Fit basic can attend.

17. great program of dance, Tai Chi, and some yoga Low impact with slow controlled movements

I am not sure what the question is here, but if you read #11 above, you will see my rationale for not recommending any one program.

18. Equipment - What about power plate or vibration plate training for bone loss prevention?

The evidence to date does not suggest that vibration training can prevent bone loss in postmenopausal women. Without hesitation I would recommend resistance training in combination with aerobic training and balance training over vibration training.

19. Is it advisable to do shoulder exercises that require lifting weights over the head if you have osteoporosis?

No. There are other options for training the shoulders, including lateral or front shoulder raises, or upright rows.

20. Wearing weight vest (5-10% of own weight) and walk if person has osteoporosis on the spine?

I would not recommend weighted vests during walking as it results in sustained compression of the spine during a dynamic movement. Rather, I would recommend doing the walking unweighted to achieve your recommended quota of moderate to vigorous aerobic physical activity, and then doing exercises to train back extensor muscles for endurance to improve posture and create muscle pull on the spine. Adding resistance training muscles for strength for all other major muscle groups will require you to use other muscles to stabilize your spine, which, combined with the back extensor training, may be a more effective stimulus for maintenance of bone mass.

21. Strength Training: I am a student in Human Kinetics and a teacher in one of my courses on exercise prescription said not to prescribe squats to people with osteoporosis. Is this right?

Squats are an excellent multijoint movement that is also functional – you need to squat multiple times per day. Also, people who cannot get out of a chair without using arms for support are those that are often at risk of falls and fractures, and squats train the muscles you need to get out of a chair. However, they are not enough. One needs exercises to challenge all major muscle groups. So squats could be used to target hip/knee extensors and flexors, but you need other exercises for lower leg muscles, chest and back muscles, and arm and shoulder muscles, in addition to exercises for back extensors.

22. To whomever wrote and sent this email to me, and to Dr. Giangregorio;

Thank you for an interesting and informative presentation. I have previously, over years, read much about health, musculo-skeletal health and anatomy and physiology. As I age and have developed osteoporosis, I have read about how this influences my health and what I can do to prevent further bone loss and to keep my muscles and bones as healthy and functional as possible. Given this while there was much information in the presentation that I did know, I was pleased to find some emphases to which I had not given adequate attention, these included 1. the idea of 'spinal sparing' and several ways discussed to accomplish this, 2. when weights are most detrimental to the spine, at which heights when held and raised, and including the head as weight, 3. your suggestions about safe ways to weight train. Several others I have been talking about, to others, quite a bit, including the importance of posture and balance training, how sitting is deadly, and that many exercise machines and classes can be too fast paced, with heavy expectations that are not safe for an osteoporotic person. I do practice yoga somewhat, and find it is a good overall source of body stimulation thus helps the blood circulation to all parts of the body better than any other exercise form I know. Yoga can and often is done at a slow pace with attention to each person exercising at their own pace.

My only frustration with this presentation was that I had a question and was unable to find how to register my question to the presenter so I could hopefully get some help. My issue is with an existing musculo-skeletal injury, especially of the legs or feet, which results in a required immobility, dangerous for anyone with osteoporosis. How does one keep the rest of the body, including the legs and feet healthy when you cannot weight bear or have limited weight-bearing for weeks or months? This is a common occurrence for people with osteoporosis and in my view it would be helpful to be a required part of a presentation like that of today. I personally am attempting to keep a little healthy by doing yoga moves without using the injured foot, and today I went for a brief swim keeping the injured foot as still as possible while the leg [only] did the [leg and foot] work of the stroke. This is 3.5 weeks after a small foot-bone break. I know of people with more severe injuries who have fewer options, and I wonder if they are getting help with how to start and keep exercising during the period of healing, which cannot occur well if they do not find ways to exercise.

Many thanks for your thoughtful and useful comments. My suggestion would be to review "After the fracture" on Osteoporosis Canada's website as a start. You have made the right choice in trying to find ways to target other muscles that are not affected. Because injuries and chronic conditions are so variable, and I had limited time, I could not address how to modify activities in the presence of other conditions. The best way to address chronic conditions or injuries is to consult a Bone Fit trained physiotherapist. If

that is not possible, you can try to find exercises you CAN do, even if they don't involve movement. For example, while lying on a bed on one's back, pressing a leg into the bed while stabilizing the rest of the body will activate the muscles in the legs that extend the leg at the hip. One could also tie a resistance band firmly around the thighs and practice extending the hips outward, against the resistance, while lying on one's back. In addition, one could continue to do upper body exercises and exercises to target the back extensor muscles while healing. I cannot provide recommendations specific to your injury without an assessment of impairments and osteoporosis risk, but a physiotherapist could.