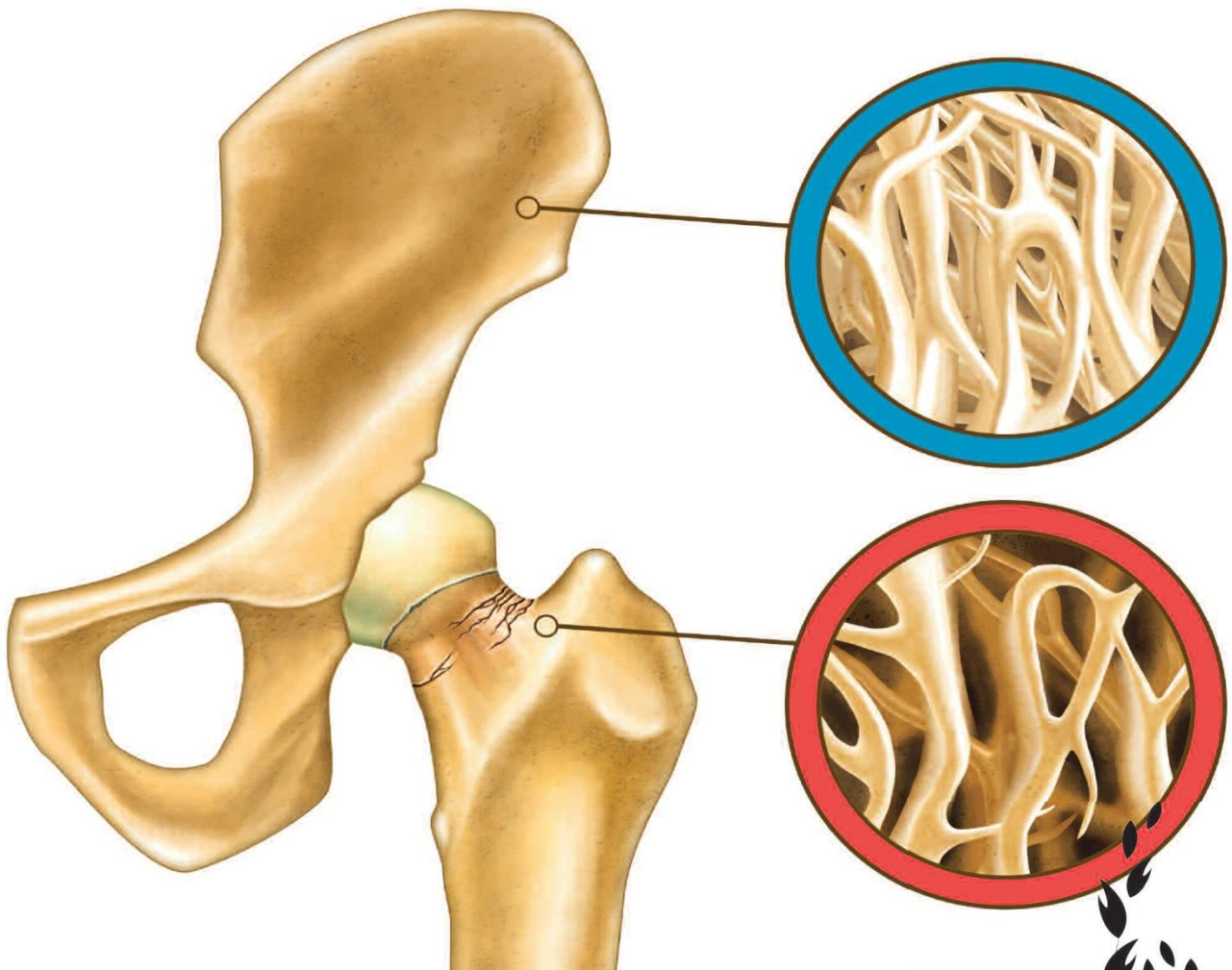




Physiotherapy Eating Disorder
Professional Network

Exercise, Activity & Osteoporosis with an Eating Disorder



Service User Information
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Exercise, Activity & Osteoporosis with an Eating Disorder

Osteoporosis is a condition of low bone mineral density (BMD), deterioration of the inner structure of the bones and reduced bone strength. This leads to fragile bones that break more easily. The broken bones, known as fragility fractures or low impact fractures, occur mostly in the spine, wrists and hips. Stress fractures in the feet are commonly seen in those with eating disorders (EDs).

Unfortunately, broken bones in the spine, known as vertebral fragility fractures (VFF) and referred to as: compression, crush, biconcave or wedge fractures cause permanent changes, such as a loss of height and spinal curvature which can consequently lead to persistent pain and disability. Preventing these changes becomes really important for long term health.

There are many factors that are thought to contribute to the lowering of BMD in EDs including; hormonal changes- such as reduced oestrogen levels and the resultant loss of menstruation, low testosterone and androgen deficiency plus many other hormonal disturbances; prolonged malnutrition; loss of muscle mass for bone loading and low body weight to load weight bearing.

Throughout childhood, adolescence and young adulthood, bones increase in density and strength until around the age of 30 when we reach, what is known as, 'Peak Bone Mass' (PBM). Think of this as your 'Bone Bank'. In women, bone turnover stays fairly stable until the age of 35 after which a little bone loss begins to occur until menopause is reached. After menopause it declines steeply for 5-7 years. Men, however reach a higher peak bone mass than women and their bone loss declines more steadily after the age of 50 years, meaning that they are less likely to suffer with osteoporosis than women. Bone loss; where the inner structure within bones begins to thin and break down, continues with advancing age which is why osteoporosis and fractures are more common in old age. Bone becomes less flexible and more brittle as we age.

The onset of Anorexia Nervosa (AN) in adolescence or young adulthood however interrupts the building of bone density and strength. In fact, the opposite happens and losses occur. The outer cortex of bone thins and is less dense and the inner trabecular density lowers. PBM ends up being lower than expected (less bone in the 'Bone Bank') especially when there has been significant weight loss and amenorrhoea over a long duration, during these important years. Many young females and males with AN and to a lesser extent Bulimia Nervosa (BN) develop bone density significantly lower than expected for their age, significantly increasing their risk of breaking bones with minor impact and leaving them more vulnerable to fractures with advancing age.

It is important for you to know that the best treatment for improving your bone health when you have an eating disorder, is weight restoration, good nutrition and for females, restarting your menstruation. The younger you are and the quicker you do this will result in the best outcome for your long-term physical health. Being under the age of 30 gives you the best chance of restoring some of the bone losses and rebuilding your 'Bone Bank', though improvements can be made at all stages of your life. You are advised to act to restore your health, even though you may not feel any different physically at this stage, because it may impact your future activities, exercise and quality of life.

A DEXA bone scan will indicate whether you have a diagnosis of osteoporosis, osteopenia or 'low bone mineral density for age, gender and ethnicity'. It measures quantity rather than quality of bone. Low BMD is considered a risk factor for fractures but is not a perfect measure of bone quality or strength. Fracture risk is multifactorial and is associated with age, sex and age at diagnosis. Do discuss your bone scan (including T and Z scores), bone strength and fracture risk (FRAX) with the Physiotherapist and Doctors so that your care is specially tailored to you.

This leaflet is best used in conjunction with The Royal Osteoporosis Society (ROS): Exercise and physical activity for osteoporosis and bone health. Following the 'Strong, Steady and Straight' documents developed by leading clinical experts the ROS provides comprehensive information, 9 fact sheets and numerous videos and films to accompany the information.

Newest evidence and expert consensus for those with osteoporosis at healthy weight, suggests that physical activity and exercise is not associated with significant harm, including vertebral fragility fractures and in general the benefits of physical activity and exercise outweigh the potential risks. Exercise has an important role in promoting bone strength, reducing falls risk and managing symptoms. Individuals with osteoporosis should be encouraged to do more than less, focusing on 'how to' rather than 'don't do'. *However*, the expert group recommends more caution for people with vertebral fractures or multiple low trauma fractures, who will have greater general bone fragility and a higher risk of further fracture.

The following information is a guide on effective and safe exercise for bone health. When unwell with an eating disorder, the recommendations require adaptation depending on your health status, risks and fractures whatever your BMD (see- Appropriate exercise and activity/Caution).

Strong- details types and amounts of exercise and activities to promote bone strength. These include weight-bearing/impact exercise and muscle strengthening/progressive resistance exercises.

Steady- details exercises and information to improve balance and reduce falls especially for the less steady and over 65s.

Straight- details exercises to strengthen the back muscles, manage pain from vertebral fractures, postural exercises and correct techniques for bending, moving and lifting.

Strong

Both impact (weight bearing) and muscle strengthening (progressive resistance) exercises stimulate bones and promote bone strength.

Impact/Weight Bearing Exercise

Variety and surprising your bones with different movements, directions and speeds, rather than long durations of repetitive exercise is more beneficial.

- Lower impact exercise and activities are suitable for those with a diagnosis of osteoporosis and **spinal fractures or multiple low trauma fractures and whilst stress fractures in the feet are healing**.
- Moderate impact exercise and activities are suitable for those with a diagnosis of osteoporosis **without fragility fractures**.

Note: - Moderate impact exercise and activities may be suitable for some individuals with a diagnosis of osteoporosis where **previous spinal fractures or multiple low trauma fractures are healed and pain free**. This might be appropriate depending on the number and types of fragility fractures, pain, fitness, previous experience, health status including BMI and menstruation and age etc. Individual physiotherapy or medical advice is recommended.

Impact exercise levels

Lower impact activity or exercise is a broad term that includes activity in which there is a small amount of impact through the bones, such as walking, hiking, side steps and gentle heel drops. Usually, at least one foot remains on the ground.

Moderate impact activity or exercise is when a moderate force is created by pushing off and returning to the ground; usually both feet leave the ground but with less height and force than

high impact activity. Examples: running, jogging, stride jumps, jump rope, Highland dancing, jumps and hops. Some exercise, such as stamping and heel drops with sufficient force, can create moderate impact even though one foot remains on the ground. Sports such as racquet sports, track events, most ball games and martial arts. High impact activity or exercise is when a large force is created on returning to the ground, usually from a greater height (e.g. from a higher jump or from a higher jump to a lower level). This includes landings from exertional jumps such as high vertical jumps, star jumps, tuck jumps and drop landings. Sports such as volleyball, basketball and gymnastics may include high-impact activity.

Swimming, cycling and water aerobics have many health benefits, but are not weight-bearing exercises. If they sufficiently strengthen muscles at target sites, then they may promote bone strength.

Muscle strengthening/ progressive resistance exercise

Exercises should target the most vulnerable sites affected by osteoporosis (spine, hips and wrists) and progress in the intensity of resistance.

- When strengthening using weights, resistance bands and gym equipment, get specialist advice for good form and technique and progress the intensity gradually, tailoring to individual fitness and ability.

-Back strengthening exercises include those lying on your front, lifting the head and shoulders and adding movements of the arms and legs. They can be performed in other positions too. These exercises will also help you hold a better upright posture.

-Strengthening the core muscles to improve spinal stability and support of the spine in everyday activities will have a positive influence on posture and balance. Pelvic floor strengthening exercises can help improve stress incontinence.

Steady

-Balance exercises if you are less steady and/or over age 65.

Straight

-Strengthening the back muscles has been shown in research studies to increase bone mineral density in the spine and to reduce the risk of vertebral fractures. Back strengthening exercises also help towards maintaining, or regaining, a healthy posture.

-Postural exercises are important to maintain joint range and soft tissue flexibility and promote a good upright posture, which can reduce the risk of developing an increased spinal curve (kyphosis) and vertebral fractures.

These exercises include: upper back extension (bending backwards), shoulder retraction and depression (stretching shoulders backwards and downwards), chin tucks (lengthening the back of the neck) and front of the hip stretches.

-Learn safe moving and lifting techniques and the hip hinge for safe bending.

Appropriate exercise and activity:

It is made clear in the documentation that some groups, those with AN and compulsive exercise behaviour - have an individualised exercise programme drawn up by healthcare professionals involved in their care. This is because excessive amounts of exercise and activity associated with the eating disorder, could potentially add to the bone strength problems and delay recovery from the eating disorder, meaning that the information above is dependent on your health status and risks.

The Physiotherapy Eating Disorder Professional Network, service user information leaflet 'Managing Activity and Exercise with an Eating Disorder' supplements this leaflet and gives more detail in recognising and managing compulsive/dysfunctional exercise behaviour.

Recent evidence demonstrates that those with AN have consistently reduced BMD across all skeletal sites, significantly increased chance of osteoporosis and a 1.8-fold increase in fractures compared with those with their healthy peers. Fracture risk is lower when AN is diagnosed when younger (age 6-24). AN is also associated with a three times greater lifetime risk of fractures with up to 57% of women with AN sustaining at least one fracture in their lifetime. Amenorrhoea is associated with lower BMD in AN compared to those who retain menstruation. Dysfunctional and excessive exercise & activities undertaken while unwell with AN are not protective to bone health and indeed risk further decreases in BMD. With BN there is a lower prevalence of osteoporosis compared with AN and only lumbar spine BMD may be reduced, however further research is needed to compare levels of osteoporosis and fractures in BN with healthy controls. This may highlight the significance of menstruation to your bone health.

Advice on the amount and type of exercise and activity therefore needs careful consideration so that it does not interfere with weight restoration and the return of menstruation (if female). Exercise may in fact be harmful to you if it results in plateau at an unhealthy weight or further weight loss, placing your bones at further risk. The amount you do should be in line with good progress. The *good news* is that exercise has been shown to increase BMD when an individual is weight restored, so when appropriately timed, a suitable bone building programme gives you the chance to reverse some of the losses and indeed re-strengthen your bones.

CAUTION:

Bending forward exercises place the spine in the kyphotic (curved) posture compressing the front of the spine, which might increase your chance of wedge fractures. These general recommendations for exercise with osteoporosis are to be 'on the safe side'.

Modify or find alternatives to movements or exercises that involve sustained, repeated, uncontrolled or end-range forward flexion (forward bending).

Any exercise that causes the back to bend forward excessively into a 'C' shape, particularly with added load, should be modified or avoided.

Further to the information above, these include:

- flexion exercises in standing, such as touching the toes/Pilates roll-down, because they are loaded by gravity and weight of the arms.
- sit ups, abdominal crunches, twisting crunches/sit ups, Curl ups, 'abdominal and oblique prep' and exercises in a flexed spinal position that are end of range, repeated, sustained or loaded with force or weight.
- exercises that flex the spine excessively in the Pilates C-curve especially with added load such as 'teaser' 'rollup'.
- rolling into a ball and rolling around on the spine in a fully flexed position.
- Be gentle with articulation into a high shoulder bridge to avoid hyper flexing the mid back.

When doing routines in exercise programmes such as Pilates and Yoga, there are many modifications and alternative exercises that can achieve the same goal whilst reducing the risk of injuring your spine, such as the 'Cat' or 'One leg stretch' with the head remaining on the mat.

As a precaution, using alternative moves that keep the back straight, such as the 'Hip hinge' or bending in a controlled and comfortable range and way should be considered.

Maintain normal functional movements and day to day activities, such as bending to put on your shoes, in order to maintain strength and flexibility. Be guided by pain and comfort levels.

But individuals who are experienced, demonstrate flexibility in the spine, have very good core muscle strength and manage the movements comfortably and smoothly can continue as long as they are fit enough to manage them with ease.

However, more caution is recommended for people with vertebral fractures or multiple low trauma fractures, due to a greater general bone fragility and a higher risk of further fracture.

a. If you have had vertebral fragility fractures (VFF) or multiple low trauma fractures and osteoporosis/low BMD and you are not weight restored with amenorrhoea (if female):

Follow caution information above (page 4). Follow specific advice while fractures are healing.

b. If you have a diagnosis of osteoporosis without fragility fractures but you are not weight restored with amenorrhoea (if female):

As for all with osteoporosis to be on the 'safe side' follow caution information above (page 4).

Remaining at an unhealthy weight, with amenorrhoea is likely to be further reducing bone health and increasing fracture risk, especially the longer and the further from healthy you remain. Also, it is more likely that you may not have adequate muscle strength or control or be fit enough to manage the exercises with ease.

An assessment to determine individual risk and formulate an individual plan is indicated.

c. If you have a diagnosis of osteoporosis without fragility fractures, (or you had them in the past when you were unhealthy but they are now healed and pain free) and you are weight restored with regular menstruation (if female):

As for all with osteoporosis to be on the 'safe side' consider caution information above (page 4) and But (page 5 above). Being on the 'safe side' should be appropriate to individual circumstances such as age, FRAX score and personal choices. At this point bone health may be improving and a bone building exercise programme used appropriately can promote bone strength.

Some sports and leisure activities involve an inherent risk of injurious impact, falling and fracture, such as contact sports, horse riding and skiing. Consider benefits versus risks and modify as necessary. In general, the benefits of regular exercise outweigh the potential risks.

d. As part of recovering from an eating disorder, improvements in bone health may be seen at a healthy weight and with healthy hormonal balance. When you are no longer in the osteoporotic range and you are healthy, caution may no longer be necessary.

Management following fragility fractures:

Physiotherapy can help you with managing your pain and rehabilitation if you sustain a painful spinal fracture. Rehabilitation will depend on your health status and risk.

Stress fractures in the feet require rest from the activity that caused them, to facilitate healing.

When returning to resistance exercises, there isn't a specific weight limit; you should avoid maximal or near-maximal exertion lifting, use good judgement on your risk and capacity, and use safe lifting principles, good form and careful progression.

If you want to engage in physical activities or sports and especially if you enjoyed these pre-fractures, they are encouraged *if they can be performed safely or modified appropriately* (e.g. modifying a golf swing).

Pilates exercises are often recommended. The strength training and weight bearing aspects of Pilates are thought to promote bone strength. Classes incorporate a wide range of exercises which can be carefully considered and modified for people with osteoporosis. Pilates exercises also focus on alignment, posture, balance, flexibility, breathing, mindful movement and retraining the core stabilisers, to support the spine during everyday activities. The energy expenditure with Pilates exercises is relatively low, whilst still producing the desired outcome. This type of exercise is therefore more appropriate and favourable for someone recovering from an eating disorder.

If you are considering attending an exercise class it is important to discuss this with your Physiotherapist or healthcare professional as not all classes will be recommended for all individuals. It is advisable to find a class with an instructor who is knowledgeable in osteoporosis. It is important to be open with class instructors and exercise professionals about your bone health.

As your BMI increases, the amount of exercise that you will safely be able to engage in will increase. It is important to work with the Physiotherapist and Multi-Disciplinary Team to identify an appropriate type and amount of exercise for you; in order to reach a healthy balance between activity and nutritional intake to progress restoration and to maintain a healthy weight.

Other positive lifestyle choices and pharmacological treatments such as HRT with transdermal oestrogen, where appropriate are a part of the broader picture in promoting bone strength.

Remember that restoration of weight, menstruation and a balanced diet are the most effective treatments for restoring some of the lost bone mass, improving bone strength and preventing further bone loss.

Leading a healthy active lifestyle and getting back to activities or sports you enjoy are the goals in the long term.

For further information on anything contained in this leaflet or for individual advice, consult with your Physiotherapist.

Latest update: Version 4 October 2023

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To be read in conjunction with: 'Managing physical activity and exercise with an eating disorder' Patient Information Leaflet July 2020; Kate Brown, Advanced Specialist Physiotherapist
<http://cpmh.csp.org.uk/physiotherapy-eating-disorders>

Leaflet 9 & accompanying video: 'Pilates exercises-modifications with osteoporosis' Information leaflets 1-9, February 2019 STRONG, STEADY AND STRAIGHT. An Expert Consensus Statement on Physical Activity and Exercise for Osteoporosis. Films/resources.
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