People with painful vertebral fractures need clear and prompt guidance on how to adapt movements involved in day-to-day living, and exercises for posture and pain. Professionals should avoid restricting physical activity and exercise unnecessarily according to bone mineral density (BMD).

Physical activity and exercise is not associated with significant harm including vertebral fracture – though some caution is advised, the benefits of physical activity and exercise outweigh the risks.

Key Principles

- Physical activity and exercise has an important role in the management of osteoporosis – promoting bone strength, reducing falls risk and managing symptoms.
- People with osteoporosis should be encouraged to do more rather than less. Adopt a positive and encouraging approach – ‘how to’ rather than ‘don’t do’.
- Physical activity and exercise is not associated with significant harm including vertebral fracture – though some caution is advised, the benefits of physical activity and exercise outweigh the risks.
- Professionals should avoid restricting physical activity and exercise unnecessarily according to bone mineral density (BMD).
- People with painful vertebral fractures need clear and prompt guidance on how to adapt movements involved in day-to-day living, and exercises for posture and pain.

The statement is structured around important themes for osteoporosis:

**STRONG** – the types and amount of exercise and physical activity needed to promote bone strength.

**STEADY** – the importance of including exercise and physical activity to reduce falls and resulting fractures.

**STRAIGHT** – a focus on ‘spine care’, keeping the back straight. A positive approach to bending, moving and lifting safely to reduce the risk of vertebral fracture, improve posture and relieve pain after vertebral fracture.

**Strong – for bone strength**

**Weight-bearing/impact exercise**
- Most days of the week; build up to 50 moderate impacts (i.e. low level jumping, jogging, dancing, hopping).
- If frail, less mobile or has vertebral or multiple low trauma fractures – up to 20 minutes of lower impact activity (e.g. walking).
- Avoid sitting for long periods.

**Muscle strengthening** (with increasing resistance)
- On 2-3 days a week - activities or exercise to feel a push or pull on the muscles (explain mild discomfort afterwards is normal). For maximum benefit, depending on fitness levels, recommend increasing the intensity of exercise to work muscles harder using weights or resistance bands. Build up to 3 sets of exercises with 8-12 repetitions of the maximum weight that can be lifted safely.
- Exercises to strengthen back muscles will promote bone strength in the spine.

**Steady – to reduce falls**

- If unsteady, over 65 and not taking regular exercise – do some challenging balance exercises 2-3 days a week.
- If repeated faller consider referral to falls service/physiotherapist.
- Posture training and back exercises to improve kyphosis may reduce falls risk.

**Straight – a ‘spine caring’ approach**

- Correct techniques for moving and lifting including the ‘hip hinge’.
- On 2-3 days a week – exercises to strengthen back muscles to help with posture with a focus on endurance by exercising at low intensity - up to 10 repetitions, held for 3-5 seconds. Daily exercises to relieve back pain.
- Consider physiotherapy referral for painful fractures or mobility problems.

**SAFETY – Adopt a positive encouraging approach** – explain that fractures are rarely caused by exercise and the benefits outweigh the risks.

**With osteoporosis**
- Recommend correct techniques when using weights or resistance bands, gym equipment – get specialist advice if unsure.
- Recommend modification of exercises that involve end range sustained repeated forward bending unless you are using the ‘hip hinge’/are very experienced/have very good muscle tone and control.
- Always increase intensity gradually and tailor according to individual fitness and ability.

**With vertebral or multiple low trauma fractures**
- Recommend lower impact rather than moderate impact exercise (jogging, low level jumping) as a general rule. May be appropriate to increase after individualised discussion.

**With poor balance**
- Recommend improving balance and muscle strength before increasing physical activity levels.
Using the recommendations

**All patients with osteoporosis**
Low BMD, higher fracture risk, fragility fractures including vertebral

- Frail, falling or unsteady?
  - YES
  - NO

- Back pain or other vertebral fracture symptoms
  - NO
  - NO
  - YES

**Prioritise STRAIGHT**

**Strong**

- **MUSCLE STRENGTH**
- Progressive muscle resistance

- IMPACT FOR BONE STRENGTH

- Vertebral fracture?
  - NO
  - YES

- Moderate impact
- Lower impact

**Prioritise STRAIGHT**

**Steady**

- Exercise for: BALANCE, GAIT and muscle strength exercise
- For frequent fallers – advice from falls service/physiotherapist may be appropriate

- Progress to STRONG and STRAIGHT if not yet included

**Straight**

- Advice on: MOVING, LIFTING
- Exercise for: BACK STRENGTH, POSTURE

- Progress to STRONG and STEADY if not yet included

**For some individuals moderate impact may be appropriate depending on number of vertebral and other fragility fractures, level of fitness & muscle tone, previous experience of moderate impact exercise, back pain from fractures etc.**

*Definition of osteoporosis*
The term osteoporosis is used throughout this statement as an umbrella term to include someone with low bone mineral density (BMD) in the osteoporosis range (a DXA bone density scan measurement) or a significant fracture risk (based on fracture risk assessment) with or without fragility fractures (including vertebral).
### Quick guide: exercise and activity details

#### Exercises

<table>
<thead>
<tr>
<th>Weight-bearing/impact</th>
<th>Lower body/hip ⬅️</th>
<th>Upper body/spine ⬅️</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Moderate</strong></td>
<td>Squats</td>
<td>Wall press</td>
</tr>
<tr>
<td></td>
<td>Sit-to-stand</td>
<td>Bicep curl/tricep press</td>
</tr>
<tr>
<td></td>
<td>Hip abduction, extension &amp; flexion</td>
<td>Chest press</td>
</tr>
<tr>
<td></td>
<td>Toe raises/heel walking</td>
<td>Back extension</td>
</tr>
<tr>
<td></td>
<td>Tandem stand/walk</td>
<td>Tennis ball squeeze</td>
</tr>
<tr>
<td></td>
<td>Single leg stand</td>
<td>Overhead press</td>
</tr>
<tr>
<td></td>
<td>Reduced base of support/uneven surfaces</td>
<td>Dead lift</td>
</tr>
<tr>
<td></td>
<td>Using weights (best evidence), resistance bands or body weight</td>
<td></td>
</tr>
</tbody>
</table>

**Frequency and amount**
- For the less steady and over 65s – 2-3 days per week
- For fallers – Most days, challenging balance programme – under guidance

### Sports and activities

<table>
<thead>
<tr>
<th><strong>Weight-bearing/impact</strong></th>
<th><strong>Upper body/spine</strong></th>
<th><strong>Lower body/hip</strong></th>
<th><strong>All sites</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Running/jogging</strong></td>
<td>Circuit training</td>
<td>Hill walking</td>
<td>Rowing</td>
</tr>
<tr>
<td><strong>Dancing including</strong></td>
<td>Aerobics</td>
<td>Rambling</td>
<td>Sports involving upper body/ power</td>
</tr>
<tr>
<td><strong>Scottish/Zumba etc</strong></td>
<td>Aqua aerobics</td>
<td>Stair-climbing</td>
<td>Pilates / yoga</td>
</tr>
<tr>
<td><strong>Racquet sports</strong></td>
<td>Pilates/yoga</td>
<td>Sports involving lunges/squats</td>
<td>Yoga</td>
</tr>
<tr>
<td><strong>Track events/team sports/ball games</strong></td>
<td>Heavy house work</td>
<td>Gardening/DIY</td>
<td>Hydrotherapy</td>
</tr>
<tr>
<td><strong>Nordic walking/rambling</strong></td>
<td>Gardening/DIY</td>
<td>Gardening/DIY</td>
<td>Aqua-aerobics</td>
</tr>
</tbody>
</table>

**Frequency and amount**
- Most days or supplement with exercises above

### Build muscle

<table>
<thead>
<tr>
<th><strong>Frequency and amount</strong></th>
<th><strong>Muscles need to feel warmth/tension</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 days per week</td>
<td></td>
</tr>
</tbody>
</table>

### Build back muscle

<table>
<thead>
<tr>
<th><strong>Frequency and amount</strong></th>
<th><strong>Correct technique</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 days per week</td>
<td></td>
</tr>
</tbody>
</table>

### Improve balance

<table>
<thead>
<tr>
<th><strong>Frequency and amount</strong></th>
<th><strong>Many activities under impact and muscle strengthening will help balance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 days per week</td>
<td>(excluding rowing, running, jogging &amp; swimming)</td>
</tr>
<tr>
<td></td>
<td>Pilates / yoga</td>
</tr>
<tr>
<td></td>
<td>Tai chi</td>
</tr>
</tbody>
</table>

### Improved posture and pain

<table>
<thead>
<tr>
<th><strong>Frequency and amount</strong></th>
<th><strong>Improved wellbeing and self esteem</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 days per week</td>
<td></td>
</tr>
</tbody>
</table>

### Fewer fragility fractures

- Strong bones
- Fewer falls
- Improved posture and pain
- Improved wellbeing and self esteem
- Strong bones
- Fewer fragility fractures
Aiming for fewer fragility fractures and improved wellbeing

**Key recommendations: physical activity and exercise for osteoporosis**

### Strong

**Build bone and muscle strength**

- **Weight-bearing/impact exercise for bones**
  - Frequency: Most days
  - 50 impacts per session
  - With osteoporosis: Moderate impact
  - Lower impact
    - Frequency: Most days
    - 3 sets, 8-12 reps of max weight
    - Progressive resistance training
  - Low impact - weight bearing
  - Vertebral or multiple fractures, or less able
    - Some extra caution
    - Exercise up to lower impact
    - Individualised advice
    - Ensure safe technique

- **Build muscle**
  - Frequency: 2-3 days / week
  - Weights & resistance bands
  - 3 sets, 8-12 reps of max weight
  - Progressive resistance training
  - Sports and everyday activities

### Steady

**Improve balance**

- Activities like tai chi or dance
  - Frequency: 2-3 days / week
  - Or a challenging balance class

### Straight

**Manage pain from vertebral fractures**

- Daily back muscle strengthening exercises

**Improve posture and movements**

- Learn safe moving and lifting
  - Hip hinge for safe bending
  - Posture exercises
  - Frequency: 2-3 days / week

**Use alternatives**

- Extreme or loaded flexion

**Avoid**

- Inactivity and prolonged sitting

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**Positive approach**

- Reassurance - 'how to' not 'don't do'

**Benefits of exercise for osteoporosis**

- Keep active
  - something is better than nothing

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**Aiming for fewer fragility fractures and improved wellbeing**

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**Quick guide: visual reference**

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