

## 08: PHYSICAL ACTIVITY AND MUSCULOSKELETAL HEALTH

### Fibromyalgia

Fibromyalgia consists of a multi symptom syndrome characterised by widespread diffuse treatment-resistant, non-inflammatory joint and muscle pains of at least 3 months duration.<sup>1</sup> Two common symptoms are: reduced muscle strength and rapid fatigue with patients typically being unfit.<sup>2, 3, 4</sup>

Fibromyalgia is difficult to manage, but physical training combined with cognitive behavioural therapy has been recognized as being the most promising treatment.<sup>5</sup> Meta-analysis of random controlled trials conclude that aerobic training has a beneficial effect on pain, fatigue, depressed mood and quality of life symptoms.<sup>6</sup> Aerobic training is thought to have the main effect on physical fitness and quality of life, whilst strength training have a greater effect on pain, tender points, depression and quality of life.<sup>7</sup>

### Osteoarthritis

Contrary to common belief, there is no evidence that regular physical activity promotes the development of osteoarthritis (OA), provided there is no associated major joint injury.<sup>8</sup>

Major joint osteoarthritis is the commonest chronic disease in older people.<sup>9</sup> The evidence that physical activity can be beneficial, is best for OA of the knee, but studies on hip and hand point to the same conclusions.<sup>9, 10</sup>

Aerobic activity is thought to increase endorphin levels which reduce the sensation of pain, whilst increased muscle strength and improved neuromuscular function improve the stability around a joint. These factors, coupled with any associated weight control, will help reduce the load through the joint and hence exercise programmes consisting of muscle strengthening, functional training and aerobic fitness have been shown to:<sup>10, 11, 12</sup>

- Reduce pain
- Improve function
- Improve overall well-being slightly in knee OA, but not in hip OA

Exercise training also reduces pain and improves function (strength, gait, balance) in the absence of weight loss. **A key message about exercise and weight loss** is that **it is better to talk about fat loss**, as weight loss is often compromised by an increase in lean mass (i.e. muscle mass). For example, exercise might produce impressive improvements in body composition, e.g. a 2kg increase in lean mass and a 2.5kg decrease in fat mass, but an unimpressive overall change in body weight, tending to discourage patients who are primarily motivated by weight loss and not an improvement in health.

There appears to be a dose-response relationship where strength and fitness improvements, lead to better gains.<sup>14, 15</sup> Training is best planned with small but steady increases in load on the joint and with exercise; there is a greater reduction in pain compared to Non Steroidal Anti-inflammatory Drug (NSAID) treatment occurring after 6-8 weeks of activity.<sup>14, 16</sup> This gives a clear choice of activity over NSAID medication for many patients and a choice with relatively few side effects.<sup>16</sup>

Perhaps the greatest incentive for exercise in osteoarthritic patients from 35 upwards with co-morbidities of cardiovascular disease, diabetes, cancer and walking disability, is that they are at significantly enhanced risk of dying prematurely.<sup>17</sup> It has been suggested even light exercise e.g.: moving around the house during commercial breaks for those patients with OA who watch many hours of TV, might mitigate the risk.<sup>18</sup> Practical recommendations have been made regarding specific exercise prescription in terms of type, duration and delivery and can be discussed by the clinician or refer to a physiotherapist.<sup>10</sup>

**NICE guideline CG 177** on Osteoarthritis: care and management recommend:<sup>19</sup>

Advise people with osteoarthritis to exercise as a core treatment irrespective of age, co morbidity, pain, severity or disability. Exercise should include:

- Local muscle strengthening and general aerobic fitness

### Osteoporosis

**Prevention:** The peak bone mass is achieved by 20 – 30 years of age, so to achieve maximum bone mass during adolescence, a balanced diet and multi-activity physical education in schools with weight bearing exercise needs to be encouraged from early years and even from first walking.<sup>8</sup> Once our peak bone mass is achieved, a gradual bone loss commences and there is now increasing evidence that physical activity can help prevent the bone loss associated with ageing across the lifespan of individuals.<sup>20-25</sup>

Weight bearing exercise, especially resistance exercise, appears to have the greatest effect on bone mineral density.<sup>26</sup> There is an inverse relationship of physical activity with the relative risk of hip and vertebral fracture with risk reduction for hip fracture of 36 - 68% at the highest level of activity.<sup>8</sup>

**Warning:** excessive physical activity can have an unintentional negative effect on bones in girls, who may develop exercise dependent secondary amenorrhoea and then lose bone most commonly around a weight of 45kg.<sup>1</sup>

**Established disease:** weight bearing exercise is still encouraged to minimize further bone loss,<sup>25</sup> but also to help prevent falls<sup>27, 28</sup> and subsequent fractures.<sup>29</sup> Balance, strength and coordination exercise combined with walking is complementary.<sup>1</sup>

**NICE clinical knowledge summary** on Osteoporosis – prevention of fragility fractures<sup>29</sup> recommend:

Advise the person to: Take regular exercise (tailored to the individual) to improve muscle strength and reduce pain and stiffness:

- Encourage walking, especially outdoors, as this will increase exposure to sunlight, increasing vitamin D production.
- Encourage strength training of different muscle groups (for example hip, wrist, and spine).
- A combination of exercise types, for example balance, flexibility, stretching, endurance and progressive strengthening exercises.



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### Contraindications

Acute illness with pain and general deterioration  
Avoid high impact activities or those with a high risk of falling<sup>30</sup>

### Rheumatoid Arthritis

Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease characterised by reduced joint flexibility, muscle function and aerobic fitness. **There is also an increased risk of cardiovascular disease**,<sup>31,32</sup> which, combined with an **increased risk of type 2 diabetes, metabolic syndrome and osteoporosis and its related fractures**, provides a very strong indication for promoting physical activity in patients with this common condition. In addition, exercise can counter the important effect of **rheumatoid cachexia**, whereby 2/3 of patients with controlled RA have significant muscle wasting and increased obesity.<sup>33</sup>

This low muscle mass and adiposity are strong independent predictors of disability in RA patients<sup>4,35</sup> and controlling disease activity by standard drug therapy including ant-TNF therapy fails to restore either muscle mass or reduce fat mass. Consequently, there is a strong case for progressive resistance training in patients with RA.<sup>36,37,38</sup>

Historically, it has been widely held that increasing the level of stress on the joints would increase pain, disease activity and joint damage.<sup>39</sup> However, major reviews on dynamic exercise therapy, have found a positive effect on aerobic capacity, muscle strength and functional ability.<sup>39-42</sup> Exercise training has been shown to redress the adverse effects of rheumatoid cachexia on body composition and also to restore normal levels of physical function in established RA patients.<sup>43</sup> Importantly there has been no increase in pain or disease activity and with long term exercise programs **no** significant differences in radiological progression were observed.<sup>39</sup>

Despite being aware of the importance of exercise, many RA patients are less active than the general population.<sup>44</sup> Patients' perceptions of the effects of exercise are a fear of exacerbation of pain, fatigue and joint damage.<sup>45</sup> They also perceive that health professionals lack exercise knowledge regarding specific exercise recommendations and the occurrence of joint damage.<sup>45</sup>

**All patients with RA should be encouraged to be physically active.** Low intensity exercise can be recommended for all patients with RA regardless of their disease state. However, to increase aerobic function and muscle function the patient needs to be encouraged to progress into moderate to high intensity exercises, **with the knowledge and evidence of improved muscle function and quality of life**<sup>39-42,46</sup> **without evidence of progression of joint destruction**<sup>42,47</sup>

### Precautions and considerations:

- Increased physical activity should be introduced slowly to minimise the risk of aggravating symptoms and in smaller increments than normally recommended
- Caution also needs to be taken after any cortisone injections and joint replacement surgery that may not stand up to intense exercise initially<sup>48</sup>
- Physical activity programmes should include a range of activity including stretching, resistance exercises and aerobic conditioning
- High impact activities or contact sports are not recommended

### NICE guideline NG100 on Rheumatoid Arthritis in adults recommend:<sup>49</sup>

People with RA should have access to specialist physiotherapy, with periodic review to:

- Improve general fitness and encourage regular exercise
- Lean exercises for enhancing joint flexibility, muscle strength and managing other functional impairments

### Prevention of falls and fracture

Older people, with or without co-morbidities, often experience diminishing muscle function and/or coexisting pain which limits their daily activity and increase the risk of a fall and fracture. Yet untargeted physical activity, such as walking and cycling, is not shown to have any effect on the risk of falls.<sup>50</sup> However, the available evidence is that group and home based programmes with muscle strengthening and balance reduce the rate of falls and risk of falling.<sup>51,52</sup>

Overall exercise interventions can reduce falls in community-dwelling older people by 21%,<sup>52</sup> whilst, exercise programmes that challenge balance and involved more than 3 hours a week achieved a higher rate reduction of 39%.<sup>52</sup> Tai Chi has been also shown to reduce the risk of falling and overall exercise interventions significantly reduced the risk of a falls related fracture.<sup>51</sup>

Although most evidence on fall prevention has been with cognitively healthy elderly people, recent evidence supports the evidence that physical activity also has a positive effect in the prevention of falls in the elderly with cognitive impairment and Parkinson's disease.<sup>52,53</sup>

Strength training may need to precede walking exercise to make the physical activity possible. In older people two decades' worth of strength and muscle mass loss can be regained by just two months of strength training.<sup>54</sup>

Identifying the optimum characteristics of an exercise intervention for falls prevention has been recently updated and reassessed, and utilising the present research it is thought that:<sup>52</sup>

1. Exercise programmes should aim to provide a high challenge to balance
2. At least 3 hours of exercise should be undertaken each week
3. Ongoing participation is necessary or benefits will be lost



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4. Fall prevention exercises should be targeted at the general community as well as community-dwellers with an increased risk of falls
5. Fall prevention exercises may be undertaken in a group or home-based setting
6. Walking training may be included in addition to balance training but high-risk individuals should not be prescribed brisk walking programmes
7. Strength training may be included in addition to balance training
8. Exercise providers should make referrals for other risk factors to be addressed
9. Exercise as a single intervention may prevent falls in people with Parkinson's disease or cognitive impairment. There is currently no evidence that exercise as a single intervention prevents falls in stroke survivors or people recently discharged from hospital. Exercise should be delivered to those groups by providers with particular expertise.

**NICE guidance CG161** on Falls in older people recommend: <sup>55</sup>

- Multifactorial interventions with an exercise component are recommended for older people in extended care settings who are at risk of falling.
- A muscle-strengthening and balance programme should be offered
- This should be individually prescribed and monitored by an appropriately trained professional
- There is no evidence that brisk walking alone reduces the risk of falling; however, there may be other health benefits of brisk walking by older people

### Key message:

Exercise is an important part of any treatment plan for a patient with arthritis or other musculoskeletal problems. It can enhance their treatment, reduce their pain, increase their mobility, mitigate against co-morbidities, improve their quality of life and lead to fewer hospital referrals.

### Consider:

1. Auditing your RA patients to see if they have been offered an exercise referral scheme and/or any patient who has fallen been offered a falls programme.
2. Advising on diagnosis of the importance of this lifestyle approach for their own well-being.
3. Referring for physiotherapy to strengthen muscles early in these conditions.

### Benefits to health professionals:

Reduced admissions, drug costs, appointments and visits.

### Useful websites for health professionals:

[The Chartered Society of Physiotherapists](#) has an excellent information section for GP's including useful exercises.

Whilst [Arthritis Research UK](#) also has information for healthcare professionals and links into patients information videos and exercise sheets, that can also be printed off for many musculoskeletal conditions.

**Signpost** patients who might be struggling because of their age and musculoskeletal conditions to [Age UK](#)

**Learn more** about the musculoskeletal problems of sedentary behaviour [here](#)

*Extracted from the Wales HEIW CPD module on physical activity [Motivate2Move](#). Now part of the RCGP Clinical Priority on physical activity and lifestyle. Review Dec 2021.*

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