EPSOM & EWELL TIMES
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3rd September 2026

ISSN 2753-2771

EPSOM & EWELL TIMES

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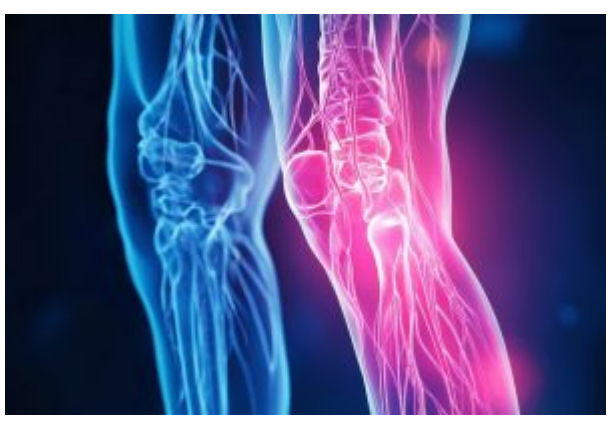
The Hidden Link Between Metabolic Syndrome and Joint Pain

28 March 2025



Many people have heard of *metabolic syndrome* as a risk factor for heart disease, stroke, and diabetes — but it's now becoming clear that it also takes a serious toll on our bones, joints, and muscles.

Metabolic syndrome is a cluster of conditions, including obesity, high blood pressure, raised blood sugar, high triglycerides, and low levels of "good" cholesterol (HDL). Affecting nearly one in three adults in the UK, it's driven largely by sedentary lifestyles and poor diet.

But beyond its impact on the heart, metabolic syndrome causes long-term inflammation in the body, which in turn affects musculoskeletal health in several key ways:

- **Joint Pain & Arthritis**: Chronic inflammation from visceral fat can damage cartilage and accelerate the development of osteoarthritis, particularly in the knees and hips.
- **Tendon Problems**: Conditions like Achilles tendinopathy and shoulder pain are more common in people with metabolic syndrome. High blood sugar can stiffen tendons, making them prone to injury.
- **Bone Health**: There's a strong link between metabolic syndrome and reduced bone density. Inflammation and insulin resistance disrupt normal bone repair, increasing the risk of fractures and osteoporosis.

The condition also interferes with the body's ability to heal and maintain tissues, meaning injuries can linger and become chronic.

The good news? Physiotherapy and regular exercise play a crucial role in managing the effects of metabolic syndrome on the musculoskeletal system. By improving mobility, reducing inflammation, and supporting healthy weight loss, targeted movement and rehab strategies can make a real difference.

So if you're living with joint or tendon pain and also have risk factors for metabolic syndrome, it might be time to take a more holistic view — and seek advice from a physiotherapist or your GP.

The Role of Physiotherapy and Exercise

Despite its challenges, metabolic syndrome's effects on musculoskeletal health can be mitigated through physiotherapy and exercise.

1. Exercise as an Anti-Inflammatory Intervention

Regular exercise reduces chronic inflammation by promoting anti-inflammatory cytokines such as IL-10 while lowering pro-inflammatory markers. A study in *Diabetes Care* (2014) showed that aerobic exercise significantly reduced CRP and TNF-α levels in individuals with metabolic syndrome.

Weight loss through exercise reduces visceral fat, a major source of pro-inflammatory cytokines, easing joint pain and improving musculoskeletal function.

2. Physiotherapy for Joint Pain and Tendinopathies

Physiotherapy plays a key role in managing musculoskeletal conditions related to metabolic syndrome. Personalized exercise programs focusing on strength, flexibility, and joint stability help manage OA and prevent further joint damage.

For tendinopathies, physiotherapists recommend strengthening exercises, which promote tendon healing and reduce pain. A *British Journal of Sports Medicine* (2017) study found that eccentric exercises significantly improved function and reduced pain in Achilles tendinitis, even in individuals with metabolic syndrome.

Additionally, physiotherapists provide guidance on body mechanics and joint protection strategies, reducing strain on joints and tendons during daily activities.

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ISSN 2753-2771

3. Bone Health and Resistance Training

Resistance training is essential for bone health in individuals with metabolic syndrome. Weight-bearing exercises, such as strength training and resistance bands, stimulate bone formation and help maintain density. A *Journal of Bone and Mineral Research* (2018) study found that resistance training improved BMD in postmenopausal women with metabolic syndrome, reducing osteoporosis and fracture risk.

Balance and coordination exercises can also be incorporated to prevent falls, particularly for individuals with weakened bones.

Conclusion: Addressing Metabolic Syndrome for Better Musculoskeletal Health

Metabolic syndrome significantly increases the risk of osteoarthritis, tendinopathies, and osteoporosis due to chronic inflammation and tissue dysregulation. However, these negative effects can be mitigated through physiotherapy and regular exercise.

By reducing inflammation, improving metabolic health, and promoting tissue repair, exercise and physiotherapy enhance musculoskeletal function and overall well-being. Individuals with metabolic syndrome can benefit from tailored exercise programs and physiotherapy interventions to manage joint pain, prevent injuries, and maintain strong bones and healthy tissues.

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