



- **FACT SHEET No. 7**

## **Predispositions and Other Important Factors in Joint Pain**

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Arthritis is very common in the general population, with more than 150 types being identified. Of these, osteoarthritis and rheumatoid arthritis are the most common, but there are many other types such as spondyloarthropathy, gout, and psoriatic arthritis. Pain is the chief reason people with arthritis seek help. It is a strong correlate of quality of life, and it interferes with day-to-day functions. Yet arthritis is inadequately treated, and a large gap exists between the benefits of current therapies and patients' expectations.

Joint-related pain is present in more than half the population older than 50, but the condition is not uncommon even in childhood. Relatively little is understood about this pain, and research has been limited to the more common forms of arthritis. In rheumatoid arthritis (present in about 1 percent of the population), the pain is predominantly related to inflammation in joints related to certain chemical messengers such as TNF-alpha, interleukin -6 and interleukin-1. Many effective therapies have successfully target this inflammation. In addition, rheumatoid arthritis can be aggravated by psychological factors such as depression and anxiety, and treatment for these can also alleviate pain.

In osteoarthritis (present in about 10 percent of the population), the pain is much less well understood and, as a result, treatment is much less satisfactory. There is a poor correlation between radiographs and pain. For many years, this made people think pain and structural change were largely separate events. However, it has become clear over the last decade that radiographs are a poor measure of joint health. More high-powered imaging techniques such as MRI scans have given a much clearer picture of where pain comes from in osteoarthritis. Pain can come from inside a joint, around a joint, or from other factors, but all of these eventually can result in the same X-ray appearance after many years.



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When looking inside the joint, one can identify specific abnormalities associated with pain. These include bone marrow lesions, cartilage defects, meniscal tears, effusion/synovitis (both are measures of inflammation), possibly osteophytes, and abnormalities in the patella fat pad. All of these are independently associated with pain, which suggests that treating each change should help alleviate pain, but such research has rarely been done.

Factors around the joint include muscle strength and malalignment. There is excellent evidence that improving muscle strength or fitness will improve pain, but it remains uncertain if this leads to further joint damage. Malalignment is a risk factor for worsening osteoarthritis but is strongly linked to bone marrow lesions so may not be independently linked with pain.

Other factors include obesity (which is the strongest correlate of pain and can cause pain in an anatomically normal joint), low level systemic inflammation, low vitamin D levels (<25nmol/l), depression, anxiety, genetic factors (mainly involved with pain processing and perhaps central pain), and variations in weather patterns. There are many evidence-based guidelines for osteoarthritis pain, but overall, therapy in osteoarthritis has been modestly beneficial. This may be due to not personalizing therapy to the individual problem. It would make sense to treat bone changes with bone agents or the overweight person with weight-loss programs, but such programs, although underway, are in their infancy. It would also make sense to treat pain earlier in the process now that we can identify its cause early. Many trials evaluating blockade of mechanisms involved in pain transmission also have had exciting results. Despite this, there is still major unmet need in the therapy of arthritis-related pain, which merits much greater investments.

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